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Deodorization of Vulcanized Rubber[1]

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Introduction

IT IS unfortunate that rubber in course of preparation and manufacture for the production of rubber goods should become associated with substances having or developing a more or less unpleasant odor. The commonly described odor of rubber is generally derived from other substances, usually low grade petroleum and coal-tar naphtha products which are employed as diluents for the manipulation of the rubber. This applies particularly to the manufacture of mackintoshes and proofed goods in which traces of the evil smelling solvents are obstinately retained. Solid rubber articles have a fainter and different odor derived from the sulphur used in the vulcanizing process which reacts with constituents of the raw rubber.

Although the odor of rubber goods is, generally speaking, neither so strong nor unpleasant as to be objectionable or interfere with their use for many purposes, the odor is a defect and interferes with the use of rubber where it might come in contact with foodstuffs, particularly commodities such as tea and beer, which take up avidly any extraneous odor and are in consequence spoiled and rendered unpalatable. For this reason brewers' hose has long been the subject of experiment with a view to the production of a rubber which will not affect the beer. Some breweries have given up the use of rubber hose on this account; while rubber lined vessels are unsuitable for brewing vats and similar purposes. Nor can rubber lined containers be used in bakeries or biscuit factories, and in fact rubber becomes unsuitable or difficult to use in the preparation or packing of foodstuffs generally. Broadly speaking very little success has resulted from manufacturers' attempts to reduce the odor.

Perhaps the best results were obtained in an after-treatment of goods, such as hose, by steaming. This removes the substances responsible for the odor from the surface layers, and for a time a great improvement results. This improvement is not permanent because the substances in the inner layers of the rubber gradually diffuse to the surface and the smell reappears.

It is obvious that to effect a real remedy it is necessary to exclude those components whether naturally present with the rubber or added in the course of manufacture which may give rise to an odor in the vulcanized rubber.

Origin of the Odors

In pre-plantation days the odor of vulcanized rubber goods mainly arose from the putrefactive substances present in African and other of the lower grades of rubber. This disappeared with the general use of plantation Para rubber, but it is evident that accelerators used today, particularly those containing sulphur, greatly aggravate the unpleasant odor associated with vulcanized rubber. Even the less active accelerators which do not contain sulphur, such as diphenylguanidine, diortho-tolylguanidine, "Sulzin" (ammoniated zinc sulphate), etc., tend to the formation of volatile "amino" substances which impart to the rubber an unpleasant odor of a different type to that derived from the more active sulphur containing accelerators, but which is also objectionable. Even rubber vulcanized without organic accelerators and made from imported pale crepe or from imported latex in the laboratory still emits an odor which, although faint, is noticeable. The use of inorganic accelerators, such as magnesia, aggravates this.

Outline of Experiments

The experiments consisted in vulcanizing rubber in molds as flat sheets with various accelerators and other ingredients and testing the products by placing some of the vulcanized rubber creped thin in stoppered bottles.

[1] *Bull. Rubber Growers' Assoc.*, May, 1933, pp. 261-63. Interim report on one of the investigations being carried out on behalf of the R.G.A. Technical Research and Development of New Uses Committee.

The contents were tested by the nose and also by reagents. Thus, there is a "sulphide" type of odor which is given off when sulphur containing accelerators are used, and in the absence of these such is evidenced by ordinary hydrogen sulphide test papers. Other accelerators develop a nitrogenous odor due to the formation of volatile substances of the "amino" type already referred to. These are tested for by woodchips or mechanical wood pulp (newspaper) subsequently moistened with hydrochloric acid.

Sometimes an "amino" reaction has been noted when the odor was too faint to be detected. The presence of an odor of the "amino" type with rubber vulcanized without an accelerator is no doubt to be attributed to the accessory non-rubber constituents present in latex and retained in the process for the preparation of the raw rubber. These constituents are broadly divisible into 2 groups, the resins and the proteins (nitrogenous matter). The removal of resins was found to have little or no effect, and no improvement was obtained although a large number of experiments were made to check this, and many duplicate tests with acetone extracted material were carried through. This was unexpected as the resins are generally supposed to react with sulphur. This may not, however, take effect unless larger proportions of sulphur are used and the vulcanization of the rubber approaches the ebonite stage. This was to some extent confirmed. If the resins are not the cause, the proteins must be. Therefore, if rubber be purified and these removed, an improvement should result. It is impracticable to purify the raw rubber, and a start must be made at the latex stage by one of the various methods available: namely, digestion with weak caustic, centrifuging, creaming, filtering (ultra-filtration), or dialysis.

Experiments with rubber derived from latex and purified by some of these methods resulted in a great improvement, and we have obtained samples of vulcanized rubber substantially, if not entirely, free from odor. We see no reason why these principles should not be adopted in the commercial manufacture of odor-free vulcanized rubber.

Conclusions

The main drawback to this process is the exclusion of accelerators (so far as we have tried them) from the mixes, which applies to both organic and inorganic substances. It may, however, be possible to find accelerators which are harmless and will also be facilitated by another discovery we have made: namely, that zinc carbonate, a substance at present seldom used in rubber compounding, has the effect of minimizing the odor so that in its presence it is possible to use diphenylguanidine or diorthotolylguanidine as accelerators, with only a very slight odor developing. In this way zinc carbonate is in marked contrast with zinc oxide and other fillers (activators) which we have used. There are a large number of accelerators and other compounding ingredients which have not yet been tried, and it is possible that with further work we may succeed in producing mixings vulcanizable at a fair speed and which, when vulcanized, are odorless or substantially so. Nevertheless the manufacture of a substantially odorless vulcanized rubber has been shown to depend on the purification of the rubber in the latex stage, so that the development of latex purification processes is essential for further progress.

Latex Rubber Thread Making

AN APPARATUS for making threads or filaments of rubber from latex is represented in side elevation by the accompanying illustration[1]. Such thread may, of course, be made from various fluid media carrying suspended rubber solids with or without rubber compounding ingredients. The particular example, however, is described as depicting such manufacture with the use of latex suitably compounded as a vulcanizable latex to make it adaptable for filtration.

Latex Rubber Thread Machine

Latex so compounded is particularly adapted to this invention as its use furthers the rapidity of production of rubber articles by enabling them to be quickly dried by the deposition of rubber on a form.

Broadly, the invention is described as involving a process and apparatus in which latex is supplied to an annular rotatable tank, over which is arranged a rotatable annular filter chamber. The latter is mounted on an axis which is at an angle to the axis of the tank so that it will dip into the tank during its rotation.

The 2 chambers are rotated so that their peripheries are moving at approximately the same speed and suction applied to the inside of the filter chamber. This action causes the deposition of rubber on the filter plate, which for rubber thread comprises a series of annular channels or grooves. After the deposit has been effected, the filter chamber continues to rotate so that the deposit upon the filter plate is brought over a drying chamber which extends around and underneath a considerable portion of the filter chamber.

A suitable source of heat such as steam is supplied to the drying chamber so that the deposit upon the filter plate may be dried and at least partially vulcanized during its travel over the drying chamber. When the drying is substantially completed, the rubber filaments or threads are stripped from the filter by a roll and turned over 3 rolls into containers suitably disposed underneath the rolls.

In this manner rubber thread may be made continuously at a rate of speed appreciably greater than is possible by the use of apparatus heretofore known. It can be seen that this continuous production is obtained by the utilization of the moving filter whose capacity to cause a deposit is not reduced by any appreciable relative movement between the filter and the media containing the particles to be deposited.

The capacity of such a machine may vary in size. One with a filter plate with 100 to 200 grooves in which relatively small rubber filaments may be deposited will at a speed of 10 feet per minute produce from 1,000 to 2,000 feet in that time.

While the invention has been described with particular reference to rubber filaments or threads, it is to be understood that other articles such as rubber bands, finger cots, gloves, etc., may also be made.

[1] U. S. Patent No. 1,909,512, May 16, 1933.

Rubber Machinery – III

Fabric Inspecting and Measuring — Brushing — Rolling — Spreaders or Stretchers — Web Guiders and Feeders — Driers — Slitters — Bias Cutters

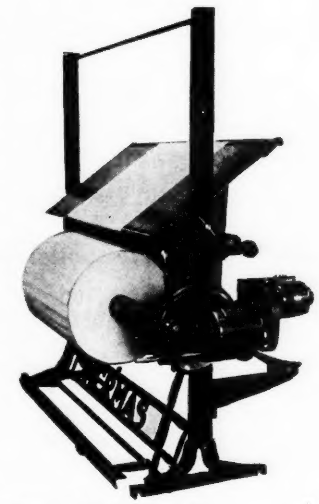
THE rubber industry in the United States consumed 128,981,222 pounds of cotton fabric in the manufacture of tires in 1932. Cotton is also consumed largely in making mechanical rubber goods, footwear, weatherproof clothing, and for liners used for handling calendered stocks. The vast yardage of textile fabrics utilized in rubber products renders essential considerable machinery designed for handling both plain and rubber treated textiles. In part this machinery is identical with that used by textile manufacturers and in part of special design as rubber plant equipment. Machines of both classes are illustrated and described in this article.

Inspecting and Measuring

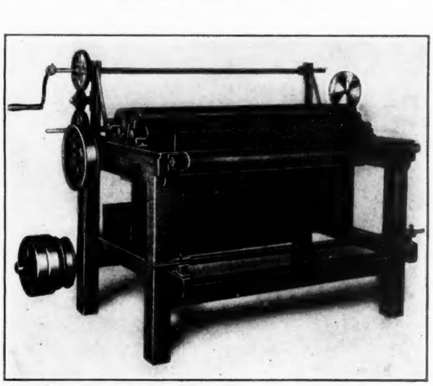
Checking the condition of fabrics as received, especially with regard to weaving and yardage, can best be done on one of several inspecting and measuring machines used in textile mills. Examination with respect to these points is especially desirable in the case of specification fabrics for the manufacture of tires, belting, hose, footwear, and weatherproof goods. Two machines for this purpose are pictured.

That in Figure 1 enables the operator to examine the entire piece while obtaining accurate measurement under natural tension. It is adjustable to any angle or light required for different qualities; it eliminates creases and can roll on paper tubes, tapered wood, or a collapsible roller which is easily withdrawn from the cloth. The machine, ball bearing throughout, is motor driven from a light socket. Built on the unit principle, the machine can be arranged to meet any requirement. It has variable speed drive to wind rolls up to 30 inches in diameter.

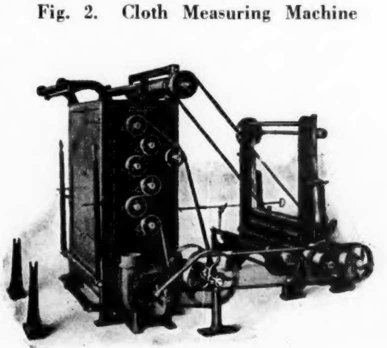
The machine shown in Figure 2 comprises a set of wooden rollers mounted on a framed and bolted wooden stand. The fabric is drawn upward from a shell supported by the bar in front of the machine and threaded through the measuring and tension rollers by hand power. The yardage is indicated on the dial, and the goods are received in the rear.



Hermas Machine Co., Inc.
Fig. 1. Inspecting and Measuring Machine, Model G. C. 30



American Tool & Machine Co.
Fig. 2. Cloth Measuring Machine



Curtis & Marble Machine Co.
Fig. 3. Heath Vertical Brushing Machine and Calender Rolling Machine

Brushing and Rolling

Fabrics for calender or spreader work should be delivered free from lint, loose threads, knots, lumps, wrinkles, or folds, compactly and evenly rolled on shells, and dried to normal moisture content. The first group of conditions mentioned are met by the use of a brushing machine in conjunction with a rolling-up stand equipped with expanding rollers or spreader bars for eliminating wrinkles.

A combination of this sort is illustrated in Figure 3. This vertical brushing machine is effective and convenient for removing lint and dirt from cotton and other goods. The machines are regularly made with 3 brushes for each side of the goods; though, if desired, other cleaning appliances can be used in place of some of the brushes. The goods pass vertically upward through the machine, and the dust and lint are brushed downward into chutes which deflect the dust and lint into hoppers at the bottom of the machine. The brushes are filled with stiff bristles which are most effective for cleaning cotton goods; though for more delicate fabrics softer bristles may be used. The necessary tension and spreader bars are arranged at the front of the machine, and the draft roll on top for drawing the cloth through.

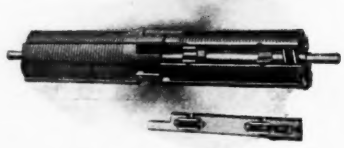
Figure 3 shows the brushing machine in connection with a calender rolling machine, which smooths out the goods and puts them up in firm, hard rolls. These machines are made with either hot or cold rolls, and spreader rollers for removing wrinkles and holding the goods out in width may be added, also twin screw rollers for straightening out turned edges.

In a rubber factory this brusher can be used not only for cleaning fabrics so that both sides will be in good condition to receive the rubber coating, but they can be used with great advantage for cleaning cotton liners in which rubber coated goods are rolled to prevent their sticking together. Another application is for brushing rubberized or coated fabrics in connection with a starch applying device so as to apply the starch

evenly and remove the surplus. When used for rubberized fabrics, a rolling head with wooden rollers would be substituted for the calender rolling machine.

Expanding Rolls and Spreader Bars

Expanding rollers and spreader bars are appliances used on fabric handling machines and rubber calenders for holding goods out in width and preventing wrinkles or creases. One style of expanding roller is illustrated in Figure 4. It is made with brass trucks and slides on the inside and wooden slats on the outside. During one half its revolution the slats are drawn outward from the center toward the end as it is turned by the cloth passing around it. The slats are of hard wood with outer surfaces plain or corrugated.



Curtis & Marble Machine Co.

Fig. 4. Spreader Roll—Type T

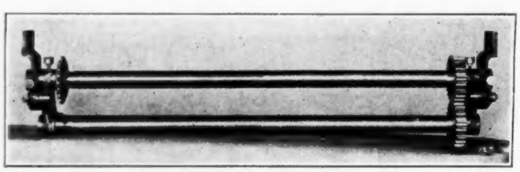
Spreader bars of several styles for calenders are available. In each case the spreading effect on the fabric arises from the smoothing effect imparted by the right and left thread on the surface of the bar. The spreader shown in Figure 5 is used largely on cotton fabrics and to some extent on woolen and other goods. This bar, sometimes called a scrimp bar, turns freely in housings by the friction of the fabric passing under tension as it enters the calender.

Curtis & Marble Machine Co.

Fig. 5. Screw Type Spreader Bar

Figure 6 represents a pair of spreader bars similar in construction individually to the bar in Figure 5. These are made singly or geared in pairs, as pictured, for special application. In the latter case they are driven by chain and sprocket at one end of the top roller of the pair.

In a third style the spreading effect is exerted by a brush in which the bristles are set in right and left spiral arrangement after the manner of screw threads. Spreaders of this style are popular because they brush as they spread. Figure 7 represents a brush spreader or stretcher located in front of the bottom roll of a rubber calender where it acts to smooth away wrinkles with no excess tension.



Rice, Barton & Fales, Inc.

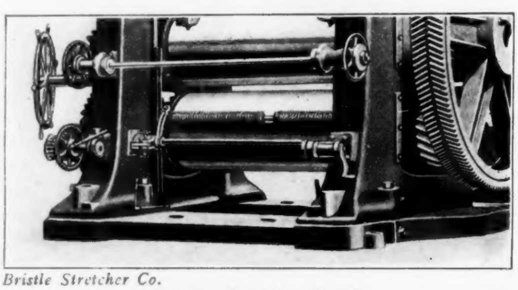
Fig. 6. Revolving Spreader

Fabric Guiders

While spreader rollers successfully eliminate wrinkles and creases from fabrics during the operations of drying, calendering, spreading, etc., they do not serve to guide accurately the goods in an exact straight course.

The pneumatic guider and feeder in Figure 8 consists of an iron casting supporting a pair of short rollers set one above the other. The lower roller is rubber covered and the upper one is of brass and journaled only at the end toward the supporting casting. On either side of the rollers and of the same length with them is a small brass shelf with rounded edges over which the goods pass into and from the rollers.

As the fabric passes through these guiders, should it tend to enter the calender unevenly, one edge or the other instantly touches one of the upright fingers of the valve operating levers. When this finger is moved by the pressure of the goods, it opens a valve, which revolves the pair of guide rollers on that side. As these are set at an angle to each other, they nip the material between them and straighten it sufficiently to center it in the calender.



Bristle Stretcher Co.

Fig. 7. Stretcher Brush

The web control layout in Figure 9 embodies the principle of uniform contact throughout the width of goods to compensate for the tendency of the fabric to creep. This type of guide is built up to 110 inches in width. The frame is designed to be bolted fast to some stationary structure and supports the revolving and adjustable parts as well as the pneumatic diaphragm motor.

Either of 2 means of control is used, depending upon the grade and the condition of the goods to be guided. A needle valve on an adjustable support, together with a nicely balanced spoon to adjust contact with the edge of the goods, is most used.

Fabric Driers

Fabrics of every sort should be well dried before being calendered or otherwise processed with rubber. For removal of moisture in fabrics either of 2 types of drier is used.

That known as a drum drier, pictured in Figure 10, is frequently used. The machine consists of drying cylinders supported on cast iron posts. It is driven by cut gearing. The cylinders are heated by steam piped to the post on one side of the machine and entering the cylinders through their bearings and journals. The condensation is removed from the cylinders by bucket scoops at the opposite end of the cylinders and is ejected through the journals and bearings to the post and thence is piped to a steam trap connected with the return lines.

Cell Drier

Figure 11 represents a cell fabric drier built on the sectional unit system. It comprises any desired number of units, each consisting of a cell, with its brass roll, sprocket, and bearings.

The cell is a hollow plate with smooth curved surfaces. The machine has no frame; the cells are piled one upon another, in one, 2, or 3 stacks, according to amount of moisture to be eliminated and the speed at which the drying is to be done.

The steam nozzle forms a continuous pipe admitting steam into each cell. The drip nozzle also forms a pipe through which the steam condensed in the cells flows away as water. The circulation is entirely by gravity.

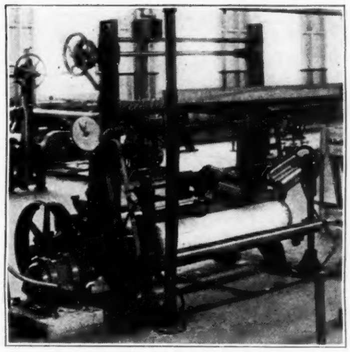
The rolls are driven by a single roller chain passing around the machine and held in contact with the sprockets by steel rails, upon which the chain rolls. A take-up sprocket is provided on the loose strand of the chain at the bottom. This drive is so efficient that the largest cell drier can be turned over by

hand, or run at a high speed, without cloth, by a ½ h.p. motor.

Fabric Slitting

Fabrics, both plain and rubber processed, regularly are required cut to exact widths in strips and then rolled. Narrow strips for liners and wrappers of plain fabric, frictioned duck for belting plies and covers, rolls of friction tape, rubber insulation, etc., are examples of the purposes for which a slitting machine is needed.

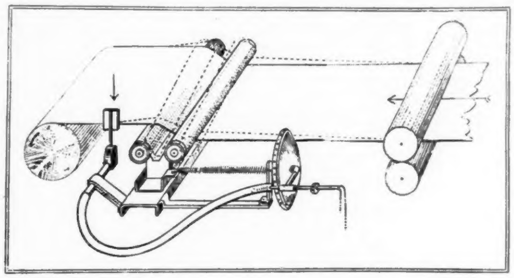
The patented system of score cutting and roll winding is perfected in numerous styles of machines for slitting textiles, paper, rubber compositions, felt, foils, etc. Manufacturers of tires, belting, hose, brake linings, and other mechanical rubber goods have need of a slitting machine of this principle.



H. W. Butterworth & Sons Co.

Fig. 8. Foxwell Guider and Feeder

The machine in Figure 12 is adapted to handle friction coated material of heavy or light weight as, for example, frictioned duck for belting. Such goods are delivered to this machine in mill rolls having a liner or separator cloth interleaved with the material. Provision is made in the machine for rewinding this liner cloth into rolls as it is removed from the material to be slit. Provision is also made for introducing a new liner or separator cloth in the rolls of the material after it is slit and prior to being wound into rolls.

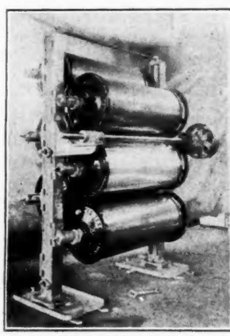


John Waldron Corp.

Fig. 9. Dickhaut Web Guide

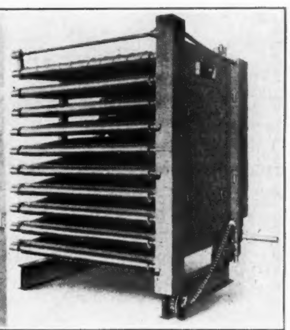
Bias Cutters

Tires and hose were formerly constructed with fabrics bias cut on the bench by hand. This method is entirely superseded by bias cutting machines of vertical or horizontal type. The familiar vertical bias cutter has undergone various developments to meet the requirements of greater accuracy and speed of production. The changes consist of a new cutting arrangement comprising a continuously running endless chain which carries several cutting knives. The improved machine is equipped with a link belt conveyer system arranged for removing the fabric cuts of any width or angle and discharging them as rapidly as produced on to a horizontal conveyer. From the latter the cuts can be spliced into continuous lengths or be made up in short lengths as the manufacturing system demands.



Textile Finishing Machinery Co.

Fig. 10. Drum Fabric Drier



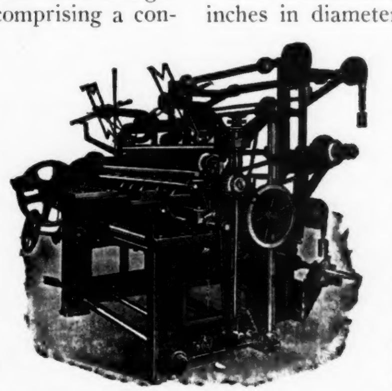
H. W. Butterworth & Sons Co.

Fig. 11. Cell Fabric Drier

The original bias cutter was a horizontal machine, subsequently largely displaced by the vertical machine. Now, however, it reappears in new and improved forms. The new-style machine is hydraulically driven and will cut from ¼-inch strips up to 40-inch widths on any angle. It can be operated either to cut a given width continuously, or the cuts may be varied so each is of a different width. The speed of the machine is approximately 45 cuts per minute. It is entirely self-contained, absolutely accurate, and requires but one operator.

Another horizontal bias cutter is operated as follows. The cutting is done by a motor driven rotary knife making 350,000 incisions a minute. A vernier control is employed to gage the accuracy of ply width duplication. Various ply widths can be cut consecutively without decreasing the number of cuts per minute, thus permitting a high degree of flexibility in preparation of stock and reducing the amount of scrap accumulated when stock is not consumed in the order in which it is cut. Pocket making, splicing of stock into continuous lengths, and other preparation operations can be combined directly with the bias cutter, resulting in a very substantial saving in labor. Stripping of the stock from the liner is automatically controlled, and the cut strips travel away on the endless belts without attention.

Machines for stripping liners are specially designed for each make of bias cutter. The double stripper embodies many improvements over the older form. It is designed to permit continual operation of the bias cutter, thus facilitating maximum production. It is so arranged that a roll of fabric can be hung in place, while the machine is in operation, ready to follow the roll being cut. Thus the necessity of stopping the cutter to change stock or remove linings and empty shells is eliminated.



Cameron Machine Co.

Fig. 12. Camachine 6 Model 20

The double stripper will take a stock roll up to 45 inches in diameter and is so designed that all rolls of stock and liners can be placed in or removed from the machine by an overhead hoist or trolley. This machine is about 5 feet high and occupies a floor space approximately 6½ by 12½ feet. It weighs 5,000 pounds. A foundation is not required, for the machine is self-contained on a cast-iron bed plate.

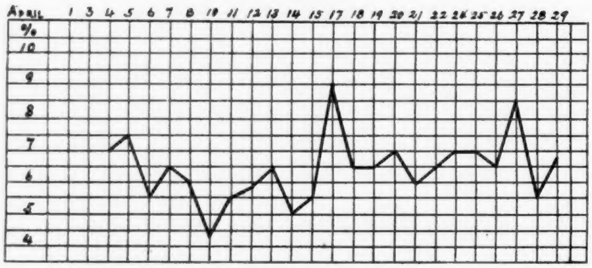
The next in this series of articles will be devoted to machinery applied to the manufacture of belting and packing and of hose built by different systems of construction and of special lengths to meet the requirements of various purposes. Do not fail to read this interesting article.

Molded Goods Scrap

Method of Reducing Cured Scrap Percentages

Ernest F. Thayer

THE cost of manufacturing vulcanized rubber products can be appreciably reduced through the use of effective methods which control the quantity of overflow or cured scrap produced. Unless steps are taken to keep the cured scrap percentage at the proper point, serious and unnecessary losses occur. Every pound of scrap eliminated per hundred pounds of rubber produced means a saving of from 4 to 10¢. It is, therefore, imperative that this phase of the business receive careful attention.



Typical Chart Showing Daily Percentage of Cured Scrap on Molded Goods

Although, like many other manufacturing problems, the matter offers perplexing difficulties to surmount, it is, nevertheless, possible to accomplish much in the way of scrap elimination, and at the same time to continue producing a high percentage of first quality merchandise.

There are, of course, many ways of handling the problem, and procedures would have to be altered to suit the peculiarities of the plant in question. The one outlined in this article has been found effective and has been operated very satisfactorily for several years.

One man, charged with the elimination of unnecessary overflow, works largely in the press room. His duties are of the nature of a liaison officer operating between the cutting machines and the presses. He has complete charge of the cutting and the dinking machines, and all orders for stock go through his hands. This plan makes him entirely responsible for the cutting of the raw stock to a volume that will produce well molded products with a minimum of scrap. He keeps careful watch of the various items as they are pressed and immediately detects any excess or lack of proper volume in the biscuits he is supplying the molders. He can then change the dies or gages to correct the difficulty.

He maintains a schedule of standard weights for the various products for which the raw biscuits are cut. This schedule shows the weight of the finished article as well as the extra weight to be allowed in the dinked biscuit to give the proper amount of overflow. The variation in the specific gravities of different runs of what is supposed to be the same stock precludes the possibility of establishing hard and fast standard weights. Rather, these weights are flexible and subject to change or correction as the need of this occurs. They work semi-automatically, however, to detect gravity fluctuations and offer an opportunity to make the proper volume adjustment before any amount of incorrect stock is cut.

The standards set are in the form of small metal disks of the weight of the finished article. Small balance scales are used to check the weight of the stock dinked against these disk standards. Actual finished pieces of the correct gravity and weight can be used for standard weight checking, although usually they do not withstand constant use so well as the disks do, nor can identification marks be inscribed on them so permanently.

The same man also keeps a daily record of the average percentage of overflow on all the important types of products. He plots these percentages on a chart of the type illustrated, keeping the graph in a conspicuous place so that his men may be influenced to have it present as good a picture as possible. The daily figures used in plotting are obtained by weighing one or 2 finished pieces of each type of product from several lots at different times during the day. This method gives representative and quite accurate figures and eliminates the necessity of weighing all the products and scrap.

This checker becomes most valuable in plants that operate on a production basis and in which neither the operatives nor the floor foreman has time to follow and correct discrepancies of this nature. On many occasions also he averts serious losses by detecting mistakes in stocks before the material is molded, which otherwise would have not been noticed until after it had gone through the presses. He also sees that all presses are supplied with sufficient stock at all times.

Oil-Resistant Rubber[1]

Following are 5 methods of treating rubber to improve its oil resistance: 1. using as little rubber as possible and much filler; 2. adding glue or gelatine; 3. adding soaps; 4. using suitable accelerators and reducing the sulphur content; 5. protecting the surface with metal or coating it with cellulose or linseed lacquers.

The first method is useful only when the article need not be flexible. The second and third methods are preferable to the first, but are useless where flexibility is essential. The fourth is the most satisfactory, and the thiuram accelerators have so far proved the best. The fifth method is simply a mechanical protection.

Sheets and hose vulcanized with thiuram have been used for over a year without showing decomposition. Sheets dipped into vegetable and mineral oil at various temperatures showed that, while the mechanical resistance remained good after a year, the volume increased. That is, the action of the oil on the rubber is in no way comparable to the strain of mechanical wear.

[1] E. Karsten, *Kautschuk*, May, 1933, pp. 73-74.

Sources of Waste in Tire Manufacture—II

Frank Allan Middleton

DEFECTIVE calendering will appear at a number of stages in manufacture and can, therefore, cause delays in unexpected and inconvenient places. Not only plies, but chafers, breakers, and bead reenforcers are subject to the effects of inaccurate gages, bare patches, wrong combinations of gum (where different stocks are processed on each side of the fabric), crushed or crowded fabrics, and the rest of the faults which are associated with the calendering of fabric.

As mentioned in the first article of this series[1], the use of wefted fabric for plies and cord breakers introduces difficulties beyond the immediate power of the tire manufacturer to overcome. Bagginess, due to the stretching of the middle cords, is the fault which manifests itself at the calender, and this condition is mainly responsible for the crowding and crushing of fabric and the cause of wavy cords. Careless calendering is frequently shown in other ways, particularly where the feed is not automatic.

Intermittent bare patches discovered in a length of fabric are caused usually by failure to maintain the calender feed or by supplying stock not properly warmed. The latter condition introduces a further hazard because inequality in stiffness of the stock produces variations in gage which may easily exceed the tolerance limits.

The preservation of correct gage during calendering depends upon the maintenance of constant conditions of temperature and speed, as well as consistent plasticity of stock. It is now usual to install a continuous record scale which at all times informs the worker of the square-yard weight of the processed material. An audible or visible signal, operated by an electrical contact of the scale-arm when tolerance is exceeded, may be added to insure immediate attention of the operator to the necessary gage adjustments.

There are times when fabrics are calendered off specification through wrong instructions, misunderstanding, or lack of care on the operative's part. In such a case if the gage is low, the fabric can be reskimmed the necessary amount, and only the additional operating expenses incurred. But if the gage is too high, the only course open is to work off the fabrics one ply at a time in the casing demanding plies of the nearest dimensions. Very often, a special "workaway" tire in which miscuts, angle-ends, and faulty components of all descriptions are used up is part of the factory program. If so, off-gage fabric can be cut into plies for that product.

The same safeguards, as outlined above, are necessary in calendering gum for sidewalls, strips, cushions, inserts, etc., to insure maintenance of accurate gage. Waste at the gum calender is largely a matter of labor and time, for any incorrectly made strips can be reprocessed directly without actual loss of material.

Extensive scrapping of these tire parts, however, may not be due to faults at the calender although the expense of such measures will be reflected in the operating charges of this machine, for it often happens that excessively long storage before assembly into casings will result in a dry condition of stock or the appearance of sulphur-bloom. Inefficient stock ordering also is sometimes responsible for the necessity of scrapping inserts and filling strips and cushions when needed liners become tied up with sizes not wanted by the immediate exigencies of production.

A study of the least wasteful methods of ordering and scheduling the products of the calender will be repaid in another respect, too, in the order in which stocks of different characteristics are processed. Something like the following will be most convenient from the operating point of view; and if the scheduling department will give proper opportunity for practising it, the operative will be able to do his work with the least trouble and delay. The plan is to calender the various stocks in the order of their temperature requirements, beginning with cool high reclaim and tacky mixings and following with the mixing next in order of stiffness, and so on to those that require the high calender heats.

On this progressive calendering plan no time will be lost by alternately warming and cooling the rolls.

In frictioning and skimming, preservation of uniformity in conditions is equally important. To maintain constancy on gage the bank of stock between the feed rolls must be kept uniform in volume and plasticity.

Another point affecting the quality of calendered products is the condition of liner cloths. Only liners clean and in good condition should be employed for all calendered goods, and to this end it may quite frequently be necessary to have men solely engaged in removing gum spots from wrapping cloths. This procedure is often long and laborious, particularly with untreated liners, but it is essential to have it performed conscientiously; otherwise delays and waste will originate in the cutting and the assembly stages. Liners themselves also contribute in no small measure to the tire manufacturer's waste bill. Improper treatment of these fabrics is by no means uncommon, and workers should be impressed with the necessity of observing the same care in handling a wrapping cloth as in handling its contents.

Most manufacturers believe that impregnation of tire cord is essential in combating the development of internal heat during service. As is widely known, this process merely involves the passage of the fabric through a solution of a lightly compounded rubber stock in a suitable solvent, squeezing off the excess solution, and the subsequent drying and winding of the cord. Its safe and successful operation is dependent, however, upon extreme care and accuracy, for the process is one which, although simple in principle, is attended by a number of accessory and precautionary operations which enhance the necessity of vigilance.

[1] INDIA RUBBER WORLD, July 1, 1933, pp. 35-37.

A frequent trouble is the retention of spots of gum by the fabric or squeezing rolls. In the latter case manual removal will be necessary; but the spots can be prevented from impairing the cord by passing it over rollers covered with cloth coated with unvulcanized gum.

On emerging from the dipping tank, the fabric enters a drying tower maintained at an elevated temperature and flooded with an inert gas, such as carbon dioxide, to preserve a non-explosive mixture with the inflammable solvent vapor. At the top and the bottom of the drier are set rollers around which the fabric passes. These rollers are plated to reduce the adherence of gum spots; however the difficulty cannot be entirely overcome in this way, and it is necessary at the completion of the operation to employ labor to clean the rollers thoroughly.

The principal source of waste, however, is the loss of solvent. When benzene was commonly used, the loss rarely exceeded 5% (using an efficient recovery plant); but with the development of grades of gasoline suitable for rubber work, recovery is seldom as high as 90%, and may average little more than 83%. The advantages possessed by a properly selected grade of gasoline, however, render it acceptable to manufacturers regardless of this waste.

Mishaps may occur before the fabric enters the impregnator, which result in tearing or misplacement of cords, but a vigilant operator can prevent them from developing serious dimensions by repairing the affected cords before they reach the machine. If they are overlooked, the possibility exists of extensive damage to the cord and serious delay in production.

There can be no doubt that efficient and economical use of the tubing machine can be secured only by close understanding and cooperation among the chemist, the designer of dies and set-ups, and the operative. Each must realize the other's difficulties and try to appreciate the exact manner the particular work of each bears upon the final result. This contention has been constantly reiterated for innumerable production processes in every sphere of industrial activity; so it may appear redundant to stress it here.

In the case of the cord impregnator, however, are special circumstances which excuse the repetition. In the first place the operator's task demands qualities of concentration, mental agility, and resourcefulness because it involves preserving a somewhat delicate balance between variable conditions and independent processes. The conditions are those of temperatures, speeds, and stocks; the processes, those of warming up, feeding, maintaining accurate widths and gages, cooling, and supervising the accessory processes which are frequently carried out while the product is traveling along the take-off belt. Such accessory operations are: assembling cushion or breaker strips to treads; checking linear weight; and punching valve holes, affixing valve pads, or printing maker's name, size, and style upon inner tubes. These details, however, will increase delays and scrap if they are allowed to become too elaborate. It is a difficult and lengthy process to secure co-ordination of a number of interdependent operations; while there is greater possibility of error and delays in the event of the breakdown of any of the auxiliary devices.

Summarized, the duties of the tuber operator are (in addition to these accessory processes): to keep an adequate bank of stock on the breakdown and feed mills to insure uninterrupted supply to the tubing machine, without danger that fast curing stocks become scorched; to adjust the amount of feed so that, while the machine is always sufficiently full to insure regularity of extrusion and maximum output, there is no danger of stock accumulating at the inlet, preventing further ingress, and resulting in a "burn-up"; to operate the machine at an optimum speed, dictated by experience and stock condition, so that within safe limits output may be high; to watch constantly such vital points as gages, width, and linear weight, which are highly susceptible to variations in the plasticity of the gum, or the presence of moisture; and to secure the synchronization of all speeds and temperatures (from the breakdown mill until the rubber leaves the conveyer belt as a semi-finished article), and the requisite dimensions of the product, all with the least possible delay, to obviate lost time and minimize the risk of scorching attendant upon returning hot scrap to the feed mill.

The writer stressed recently in these columns the importance of regulating the plasticity of factory stocks. This is nowhere more essential than at the tubing machine if it is conscientiously desired to obtain the maximum of both quality and quantity. By checking this property the chemist can greatly assist the operator, not only as to regularity and speed of extrusion, but also as to a variety of other factors which often make all the difference between efficient and inefficient operating. Two opposite examples may serve as illustration. (a) A cheap mixing, compounded principally of reclaims from whole and solid tires, will possess high inherent tackiness and softness; and where the tuber is fed by a continuous band of stock running from the warm-up mill, these qualities may prevent the feed band leaving the mill roll with sufficient readiness. The result will then be that frequent breakages of the feed are sustained, causing, at best, delays and, at worst, burning of the stock within the machine head where it is in contact with the hot die and work is done on it by the screw. The chemist can avert this difficulty by incorporating a certain proportion of medium-grade crude rubber, or he may be able to take other steps which will be effective in controlling plasticity and tackiness, so long as the trouble does not prove to be the operator's responsibility in working off excessive amounts of unsuitable scrap.

(b) A highly compounded mixing, such as a tread stock, might exhibit persistent raggedness at the edges when extruded, demanding excessive, and sometimes dangerous, heating of the die to secure satisfactory flow. The consequent waste of time in reheating the die each time the edges become discontinuous, and generally experimenting with the processing conditions, can be obviated only by a careful study of stock condition by the chemist. Sometimes the reason for the faulty condition is very obscure, and much patient examination and experimentation may be necessary to locate the exact source of the trouble; but exhaustive inquiry will be repaid, for scorching is not infrequent when dies, especially for thin flat articles, such as flaps, sidewalls, and treads, require constant reheating.

New departures of any magnitude in compounding rubber for the extruder will usually involve the necessity of altering dies. The detailed design of a die for a particular size and shape of cross-section is controlled by the type of stock to be processed; and if the design has not taken into account in a comprehensive manner and allowances made for probable variations in working conditions, serious wastage is a possibility. For example, if the rubber is stiff and the die is somewhat too large, speeding up the take-off belt is sometimes practised to stretch the product to the required dimensions. Irregular or insufficient shrinkage on cooling may then result, due to the recovery of the rubber, and tolerance limits may be exceeded. Conversely, too small a die may necessi-

(*Continued on page* 35)

Rubber under Tension[1]

And Its Function as Thread in a Golf Ball

I. Torrence Gurman

IN COMPARING the 2 threads previously mentioned[2], (a 1/16-inch by No. 62 testing 3,100 pounds per square inch, and a 1/16-inch by No. 33 testing 2,900 pounds per square inch) we would not only be incorrect in saying that the first necessarily represented a better stock, but, despite the higher indicated strength, we could not even say definitely that it was a stronger stock, since no allowance has been made for the difference in s/1/a. Were we to test similar cuts of 2 such stocks, we would find that the second would show up much more favorably than it did above, yielding a relatively higher test. In fact threads equivalent[3] to the 2 in question might well have been cut from the same stock. It becomes evident, therefore, that if we are to test various gages and cuts, and are to interpret their relative values intelligently, we must allow for the differences in s/1/a. We must, figuratively speaking, reduce them to the same denominator.

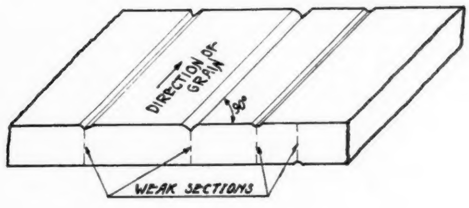


Fig. 1

Throughout this article the reasoning has been based on the assumption that the gage and the cut of the thread were uniform. In actual practice this condition is not always so. Usually there is some variation in either or both. Stock running through the calender will vary in thickness, even under the best prevailing conditions and care.

The addition of stock to the "roll" on the calender, a difference in the temperature or plasticity of the stock added, a variation in the temperature of the rolls, and calender "pockets" all tend to produce variations in the gage of a stock. No one knows better than does the maker of rubber thread how much fine para will differ from fine para, and plantation rubber from plantation rubber. Generally speaking, no lot of material is ever really homogeneous, nor can any reasonable amount of washing remove all the impurities that exist in the crude rubber. All of these will in varying degrees effect a variation in the gage of the stock. Then in the cutting of the stock, variations will also occur. *Unless the stock is rigid while being cut, the most perfect cutting machine or cutting method cannot insure absolutely accurately cut thread.*

When a variation exists in the cross-section of a thread, there results a variation of the tensile stress even though the "pull" or frictioning force remains constant. Consequently the modulus varies throughout the part of the winding where the variation in cross-section occurs. This in itself is not very harmful provided the variation is not excessive. Indirectly it results, however, in the lowering of the mean modulus of the thread because in practice the tension adjustment is governed by the *minimum* cross-section. From a kinetic point of view the resulting ball will behave as if a uniform thread had been wound at a tension equivalent to the mean tensile stress.

Besides the variations in the thread itself there are other varying factors. As mentioned above, the tension is varied at the beginning of the winding, and the tension characteristic of the winding machine comes into play. In addition the coefficient of friction varies with the rate of travel of the thread; the drag due to the rotary speed of the spool or reel varies, increasing as the amount of thread on the spool decreases; and the characteristic of the tension device or tensioning medium comes into play. This results in a variation in the stress within each ball as well as between balls.

To sort out comparatively similar balls the balls are given a "compression" test wherein each ball is subjected to the distorting effect of a fixed load. The amount of the load varies, depending on what any particular manufacturer considers suitable for his specific needs. Usually it lies within the limits between 150 and 300 pounds. Originally this test was intended to be an indication of what the ball would do when it was subjected to the effects of the blow of a golf club. This it never is! The amount a ball is distorted in an average drive with a "wood" is so great that it would require a load several times that ordinarily used to duplicate it (1,500 to 2,000 pounds would be a conservative estimate). Now the compression test is comparatively easy to perform, and if it were a *positive* indication of some definite quality in a ball, it would at least form a basis for a standard of comparison of golf balls, either wound or molded. Unfortunately it is not, and the results it yields are only approximate. Because these results are only approximate, balls that test alike both before and after molding do not necessarily perform alike.

In a general way, however, the compression test indicates the average tension under which the thread has been wound, provided the same size and type of center is used. Secondly, in the molded ball it indicates the resistance to distortion, and the corresponding advantages of (a.) lesser air resistance in the distortion stage of the ball, and (b.) lower "hysteresis" losses in the wound part of the ball, or, in other words, higher modulus (e). The conditions that prevent this method from being accurate are many. For example, of 3 balls that yielded the same test, one was wound at a uniform tension; a second was started with the last part of the thread on a spool and was finished with the first part of the thread on a new spool, with the corresponding re-

[1] Continued from India Rubber World, July 1, 1933, pp. 28-30.

[2] *Ibid.*, May 1, 1933, p. 26. July 1, 1933, p. 30.

[3] This can be accomplished by cutting stock gaging 1/16-inch and would result in a reversal of the gages and cuts.

sulting condition of high stress on the first half (more or less) and low stress on the second half; while the third was wound too "soft," was partly unwound, and then was finished up with thread under high tension. A consideration of the resulting effects of the transverse forces at once shows that these 3 balls will not give the same performance. In addition the indication of mean stress is somewhat misleading since the ball that was *finished* with "soft" winding tends to distort out of proportion to its average tension. Again, the "hardness" in the case of the molded ball may be due to a heavier or different type of cover, in which case the mean modulus (e) indication is a false one, since the extra thickness or stiffness of the cover acts to reduce it because of the internal friction in the cover stock, especially after aging. Then, again, since the modulus of the thread under tension governs the mean modulus (e), the variation in modulus (E) between different lots of thread will result in variations in mean modulus (e) in the different lots of balls, with corresponding difference in performance.

The reason that the compression test falls down is that the "hardness" found is not a measure of any definite thing. *The real value of the test lies in the amount of distortion produced.* The compression test is rather an indication of the ability of the ball to absorb and cushion the blow than of its ability to transmit the blow. The test is therefore of most value as a gage of the *toughness* of the ball and should be considered as such. To test balls for comparable distance qualities, the tensile stress, and from the stress-strain relation, the corresponding modulus at which the thread is wound is a more accurate indicator. To adopt this as a standard, however, would require that a definite type of thread be adopted for a definite type of ball.

In the manufacture of golf balls the compression test serves a unique purpose. As the wound balls are tested, they are graded into groups such that the balls in any one group have relatively the same resistance to compression (or distortion). When, therefore, the wound balls and the cover stock are assembled and placed into the press to be "vulcanized," the pressure placed on the molds during the "warming up" stage is taken up evenly by all the balls. As the distortion is uniform, the spreading or flow of the stock is accordingly uniform so that, other conditions being normal, eccentricity as between wound ball and cover is averted. The test also serves as a guide to the optimum pressure during this stage.

Among the factors that tend to vary the uniformity of the tension on the thread wound on to a ball is one that was omitted above because it merits special consideration. It is the influence of the presence or absence of a lubricant. Wherever it is possible to get along without a lubricant, it is well to do so. If the performance of the ball is as dependent on the thread in it as we believe it to be, then the presence of foreign matter, in the form of either a powder or a liquid, acts as a "loading" substance or a diluent. Some winding machines and some types of tension devices, however, operate smoother with lubricated thread and tend to roughen and, consequently, weaken unlubricated thread. Where a lubricant is desired, preference should be given to a liquid lubricant, such as glycerine. Powdered lubricants, such as talc, soapstone, polysaccharides, etc., tend to clog up bearings, flake, and form scale, and are hard to apply evenly.

The calendering of a rubber stock produces a grain. This is brought about by 3 means: namely, the directional travel of the stock, imperfections or scars in the faces of the calender rolls, and scoring caused by the presence of grit or unabsorbed particles of pigment. The ultimate result is a variation, over small sections, of the gage of the stock. A cross-section through part of a sheet of stock might yield a view such as is shown in Figure 1. Strands or threads cut directly across the grain are as a rule more liable to break than those cut along the grain. This is one reason why thread is cut "along the grain" (Other reasons are, of course, the practical ones of convenience and economy.) The phrase "along the grain" is used reservedly. When thread stock is cut on drums, the cured stock is unwrapped from the curing roll (or from the supplementary roll on which it is wrapped after being "aged") and is wrapped on to the drum, attempt is made to wrap each layer directly over the preceding one so that no overlapping occurs. Despite the flexible nature of the stock, this wrapping is usually accomplished with a remarkable degree of accuracy. If this result is not secured, the thread is cut at a slight oblique angle to grain, which is liable to cause fraying of the stock, especially where friction is applied later. To cut the thread exactly along the grain of the stock the sheet should be wrapped so that the stock moves along the roll, in the direction of the cutting, an amount equal to the width of the thread to be cut, for each revolution of the drum. This is so because the cutting mechanism advances as it cuts, cutting the stock spirally. For narrow cuts the angularity may be practically neglected, especially where the drum diameter is appreciably large. In the case of wide cuts, particularly where the drum diameter is small, there is a danger of the stock fraying as mentioned above. Where stock is cut on extremely small diameter, this condition is emphasized. Such a condition is typical in the case of thread cut from band tubing. If the stock is grainless, or cut at right angles to the axis of the drum shaft, or both, the oblique wrapping is unnecessary.

At the beginning of this article[4], the author presented a group of questions that he has more or less answered in the paragraphs that followed. In the course of his presentation other questions may have been suggested which the reader himself can probably answer. Suggestions or interpretations are offered to those engaged in the manufacture of rubber thread and golf balls for what they are worth. These industries have made and will continue to make forward strides from both technical and financial points of view, and any offering on the altar of progress will benefit those concerned *if they are willing to be benefited.*

The author has presented some new theory in this article, and though cognizant that there is ground that "angels fear to tread," he is quite satisfied to "break the ground" if his doing so will lead directly or indirectly, it matters not which, to a better understanding of the principles involved in the application of rubber thread, especially to the production of golf balls or other articles requiring the use of rubber thread or tape under tension. He hopes that this article will evolve an interest in the subject that will lead to a favorable solution of many of the problems that present themselves to the user of thread, under these conditions.

While on the subject of problems, the author will conclude by presenting the reader with an interesting problem. In the earlier part of this article[5], a paradox was explained by introducing the factor of transverse forces. This factor was also introduced to explain the contrast in indicated strength of threads of different s/1/a; and herein lies the problem. Why does the same factor produce (in effect) a reduction in modulus in one case and an increase in the other, acting, apparently, in the same direction and manner?

[4] *Ibid.*, May 1, 1933, pp. 25-26.
[5] *Ibid.*, June 1, 1933, pp. 37-38.

Coagulation of Latex

Joseph Rossman, Ph.D.

THE following concludes the abstract of United States patents on coagulating latex, begun in our June 1, 1933, issue.

19. Gracia, 1,797,192, Mar. 17, 1931. In separating rubber from latex it has been customary to cause coagulation of the rubber by adding acetic or sulphuric acid. This method was fairly satisfactory in most cases where the latex did not contain any pigments or other compounding ingredients which were attacked by the acid.

In those processes, however, in which the pigments and other compounding ingredients were added directly to the latex before the coagulation of the rubber, the method was sometimes undesirable because of chemical reactions between pigments and coagulant. Furthermore, it was necessary, when acid coagulants were used, to subject the coagulum to a process of extraction to remove the acid. This involved considerable labor and also resulted in the removal of a certain amount of the non-rubber constituents and some compounding materials.

This invention involves the discovery that amines, particularly of the type represented by the formula $R-\overset{H_2}{C}-N{<}^{R_1}_{R_2}$, in which R is a hydrocarbon group either aliphatic or aromatic, and R_1 and/or R_2 are aliphatic hydrocarbon groups or hydrogen atoms, may effectively be used as coagulants instead of the ordinary acids heretofore employed. The following are specific examples of aliphatic amines suitable as coagulants: diethylamine, ethylamine, normal propylamine, di-propylamine, tri-propylamine, normal butylamine, normal amyl amine, iso amyl amine, di-iso amyl amine, allyl amine, and benzyl amine. All these substances are relatively powerful coagulants. However, the derivatives of the higher hydrocarbons are observed to be more active than those of the lower compounds, such as the ethylamines. It has also been observed that the mono-substituted amines are more powerful in their action than the di- and tri-substituted materials. All the compounds, though, are sufficiently active to permit of their use as commercial coagulants.

The ratio of latex to amine coagulant may, of course, be varied within relatively wide limits. Satisfactory results may be obtained by using approximately 5 cc. of amine to 50 cc. of latex containing 33% rubber. These amines, because of their basic character, do not decompose the pigments which it may be desired to introduce into the latex. The coagulants, being of basic nature, need not be washed from the coagulum. Instead they may be left in the stock without impairing the quality of the material. In fact, the presence of some amines in the rubber is desirable because they accelerate vulcanization and act as age retarders in the finished product. Also their use results in an excellent product which may be employed in the manufacture of substantially any of the ordinary types of rubber goods.

20. Cornic, 1,816,764, July 28, 1931. Rubber sponge is obtained as follows: 100 gms. (or parts by weight) of concentrated latex having 70 to 80% rubber (Revertex) are mixed with 1 gm. of an accelerator base (diphenylguanidine or diorthotolylguanidine), 5 gms. of sulphur, 4 gms. of zinc oxide, and 12 cc. of water. The whole is mixed, giving a semi-fluid paste to which is added: 12 gms. of ammonium carbonate sifted. After several moments the latex is completely coagulated. This product is molded to give the desired shape and baked for 2 to 3 hours at 140° in a drying oven in an inert atmosphere. During baking, the mass swells enormously. Sponge may be obtained by coagulating the latex by physical means. It is merely necessary to add to the latex slow acting coagulators such as sulphate of magnesia, alum, magnesia, chalk, etc. These serve at the same time as saturating products. After having mixed the sulphur, water, and oxide of zinc with the Revertex, the other saturating materials, and the carbonate of ammonia, one or more of the preceding coagulator charges are added.

21. Griessbach, 1,839,191, Jan. 5, 1932. The process comprises coagulating latex with an active protease in the presence of hydrocyanic acid. Example 1: Warm air is passed through ammonia preserved latex until it has acquired a nearly neutral reaction. In this condition it is still stable, and coagulation does not occur at ordinary temperature until after several days. Ten liters of this freshly prepared, almost neutral, latex are stirred up with a solution of 5 gms. of succus caricae papayae in 100 cc. of water and maintained at 30° C. After a few hours, a white, neutral gel separates out and, when passed through the washing rollers, furnishes a highly elastic raw rubber. If the activity of the protease be enhanced, as for example by adding a dilute solution of hydrocyanic acid, the time required for coagulation is reduced to about 1/10 that required to separate the raw rubber without the addition. The activity may be enhanced as follows: 100 cc. of the 5% solution of succus caricae papayae are treated with 60 milligrams of hydrocyanic acid prepared by decomposing a solution of potassium cyanide with hydrochloric acid and left still for a few minutes. One hundred gms. of this activated solution of succus caricae papayae added to 10 liters of latex will soon precipitate an excellent raw rubber.

Example 2: By passing air through latex stabilized with ammonia, so much of the latter is removed as to impart to the latex a hydrogen-ion concentration of about $pH = 8.0$ One hundred cc. of a 2% solution of succus caricae papayae are added to 5 liters of the pretreated latex. After about 20 hours a dense coagulated product separates out; if the efficiency of the coagulant be enhanced by an addition of hydrocyanic acid, the time of coagulation is shortened to about 7 hours. If the hydrogen-ion concentration be higher, for example $pH = 6.0$, the time of coagulation is shortened to about 2 hours under the same working conditions and using the ordinary solution of succus caricae papayae.

22. Zimmerli, 1,841,076, Jan. 12, 1932. Articles are coated with rubber by simultaneously spraying latex and a coagulant such as acetic in the form of a mist. Co-

agulating salts, such as alum, may be also employed, either by direct dispersion in air or other neutral gas or by spraying a solution of a convenient concentration; or if an acid coagulant is objectionable, neutral coagulants such as alcohol or acetone may be used. Acetic acid in approximately 50% solution in water has been found very satisfactory when combined with a latex spray. The acid spray is mixed with the spray of rubber dispersion in such proportions as to coagulate the rubber shortly after it has reached the surface on which it is to be deposited. Thus the dispersion is allowed to flow sufficiently to fill all cavities and render the surface smooth and uniform. If the coagulation is too rapid, and the deposit assumes a granular, spongy appearance, the concentration of coagulant in the spray is reduced somewhat; whereas if the coagulation is so long delayed that the deposited material tends to run or flow excessively, the concentration of coagulant is increased. The combined rubber and coagulant spray is directed over the article or form to be coated, in such a manner as to produce a coating of the desired thickness upon the several parts thereof.

If it is desired to make an inner tube, a smooth mandrel of the proper diameter is rotated slowly while a combined spray of 50% acetic acid, and of latex containing sulphur, accelerator, zinc oxide, etc., in the proportions necessary to give the rubber the desired characteristics during and after vulcanization, is directed, either manually or by an automatic machine, over the length of the mandrel until a deposit of the proper thickness is produced. A strip of cloth is then worked spirally over the wet coagulated rubber to express, in large part, the water contained therein. The deposit is then dried in a heated chamber or in a vacuum, vulcanized in any convenient manner, say in open steam, stripped from the mandrel, valve stem inserted, and the ends spliced as usual.

23. Malm, 1,847,123, Mar. 1, 1932. The nitrogenous substances in latex are removed as follows: Rubber latex, diluted by adding 20 parts of water to 5 of latex is heated to 92° C., and 3 parts of a 5% acetic acid solution at room temperature are then added, the mixture being stirred until the latex is coagulated. The coagulum is then removed from the liquid and washed for 12 minutes in a washer and then dried. Samples of this product were immersed in a 3.5% sodium chloride solution and test data taken at intervals over a period of 195 days, at the end of which time the water content of the samples had stabilized at about 1.05% by weight.

The water content of an insulating material after prolonged immersion is a fairly safe index of its electrical and mechanical properties, and the water content of 1.5% for the treated rubber compares favorably with the corresponding value of gutta percha, which in grades suitable for use in submarine cables usually stabilizes at about 1.25% by weight. The following is an example of a composition suitable for submarine cable insulation. With the product resulting from the treatment of rubber latex, as described above, an insulating compound may be prepared by mixing with 35 pounds thereof, 35 pounds of deresinated commercial balata and 30 pounds of refined Montan wax.

24. Chapman, 1,852,447, Apr. 5, 1932. Cellular rubber products are made by adding a frothing and gelling agent to latex. Sodium or potassium silico-fluoride or ammonium persulphate are used as gelling agents. The following example is given. A latex mixing to give a transparent product of the type described in patent No. 1,797,250, Mar. 24, 1931, in the form of a latex concentrate, has the following composition: rubber 92 parts by weight; sulphur 2.5 parts by weight; zinc diethyldithiocarbamate 0.5 part by weight; mineral oil 5.0 parts by weight, prepared in the presence of 0.3 part by weight of caustic potash and 0.5 part by weight of oleic acid. To the cold cream 0.5 part of ammonium oleate and 1 part of sodium silico-fluoride on the dry mix are added, and the mixture is whipped into a stiff froth in any suitable manner, for example, by an egg whipping attachment of a cake mixing machine. Should a large cell structure be desired, air or other suitable gas may be blown gently over the surface of the cream or bubbled through it during the frothing operation. The foam is allowed to set in the cold in suitable molds or trays when the whole is transferred to an air oven to cure and dry. After 2 hours at 95° C. the spongy material is removed, boiled in water for 30 minutes and allowed to dry, yielding a pale translucent sponge.

25. Hazell, 1,864,044, June 21, 1932. Rubber articles are made directly from latex by diluting the latex to a solid content between 8 and 24%, adding to the latex zinc oxide and between 0.75 and 1.1% by volume of a 42% solution of an alkali polysulphide, agitating and heating the latex, and depositing rubber from the treated latex on a porous form in the shape desired by withdrawing aqueous matter through the form.

26. Twiss, 1,870,788, Aug. 9, 1932. Ammonium persulphate and trioxymethylene are incorporated into concentrated compounded latex having a water content of 10 to 40% in the order of 0.1% of each ingredient. The mixture thus produced is quite stable, but on heating to 90° C. for a few minutes it gels to a mass which can be dried without loss of shape, although shrinkage naturally occurs.

The mechanism of the process is probably somewhat as follows. The ammonium persulphate on heating undergoes reduction to ammonium sulphate and free sulphuric acid; the latter neutralizes or destroys part or all of the protective substances present and thus acts as a coagulating agent. The trioxymethylene reacts with the ammonium persulphate, thus aiding its transformation and itself undergoing oxidation to formic acid, which is, as is well known, also a coagulating agent for latex.

27. Wescott, 1,873,913, Aug. 23, 1932. Rubber coagula are formed from latex first by dispersing a heat denaturable proteid, such as hemoglobin, and then adding a latex-coagulant solid material in particle form, such as zinc oxide, under temperature conditions which constitute the proteid an effective protective against the latex-coagulant substance, then raising the temperature of the mix to a point at which the proteid ceases to be protective.

28. Murphy, 1,886,351, Nov. 1, 1932. A non-porous former is dipped into a latex having a water content of 25 to 30% and a solid content of the following composition: rubber as latex 55% (dry rubber), sulphur 2%, accelerator 0.4%, whiting 20.6% (dry rubber), zinc oxide 3%, barytes 20.6%, transformer oil 5%, color 1%.

The shape with the uncoagulated deposit of concentrated latex is then dipped into a solution consisting of 5 parts of glacial acetic acid and 200 parts of benzene (by volume) for a few minutes, when it is found that wrinkling of the surface of the deposit is obtained. The wrinkling is probably due to the swelling effect of the benzene on the coagulated surface skin formed in the first place by the acetic acid.

It has also been found that the wrinkling effect can be obtained first by dipping the uncoagulated deposit into a coagulating bath consisting, for example, of alcohol or a 0.5 acetic acid solution in water or an aqueous solution of an aluminum salt, (e.g., 5% solution) for a few seconds and then dipping the thus treated deposit into a swelling bath, as for example a mixture containing equal parts of benzene and alcohol.

29. Hayes, 1,887,201, Nov. 8, 1932. The process of making a gelling rubber composition from preserved uncompounded latex comprises reducing the ammonia content of a 60% rubber latex to not above 1/20 of 1% of free ammonia and adding formaldehyde in excess of that required to combine with the ammonia, the excess being as high as 3/10 of 1% of the latex.

The following example is given. Latex concentrated to 60% rubber content by a centrifuging process, having an alkalinity of 0.1% free ammonia is compounded to give the following composition in weight: rubber 100, sulphur 3, zinc oxide 1, accelerator 0.5, antiager 3, mineral oil 3.

To this latex mix excess of formaldehyde is added. It has been found that 20 cc. of formaldehyde solution (15% by weight of formaldehyde in strength) per liter of latex mixing in excess of that required to neutralize the free ammonia lead to the gelling of such latex mixing in 16 minutes at room temperature.

30. Hayes, 1,890,578, Dec. 13, 1932. Latex is gelled by adding a mixture of phenol and tannic acid and then adding sufficient formaldehyde to reduce the alkalinity of the latex to gel it.

For example, latex concentrated to 60% rubber content by a centrifuging process and having an alkalinity of 0.4% is compounded to give the following composition by weight: rubber 100, sulphur 3, accelerator 0.5, zinc oxide 1, phenol 0.65, tannic acid 0.35. The alkalinity value of the mix is reduced by the addition of formaldehyde to neutrality, and it has been found that the gelling of the neutral mixing occurs within 5 minutes.

31. Neiley, 1,896,054, Jan. 31, 1933. This patent covers a method of controllably coagulating rubber latex by adding to the latex complex zinc ion at a temperature below the activating temperature thereof, (i. e., the temperature below which there occurs no coagulation of the latex and above which ready coagulation takes place) to form a composition stable at such temperature, and thereafter raising the temperature of the composition to a point at which the rubber coagulates. For example, 10 parts of granulated zinc chloride are dissolved in 160 parts of water. To this solution are slowly added with stirring 15 parts of 28° Bé. commercial ammonia water.

When 42 parts of the solution are added to 300 parts of ordinary ammonia preserved commercial latex, which contains about 35% of rubber and 0.8% of ammonia and has a mechanical stability of about 8 minutes when determined by rapid stirring according to the usual standardized latex stability test, there is obtained a composition stable at ordinary temperatures, but which will readily coagulate at temperatures above 140 to 145° F. If the quantity of zinc complex employed is reduced to 35 parts, there is obtained a composition which manifests no activity at temperatures below 160° F., but coagulates readily thereabove. Similarly, if the quantity of zinc complex is increased to 50 parts, there results a composition which has a minimum coagulation temperature (activation temperature) of about 125° F.

Sources of Waste

(*Continued from page* 30)

tate reducing the speed of the conveyer so that the extruded article may "gather" between the die and the belt. It can only achieve this condition by buckling at regular intervals, and periodic variations will occur in width and thickness along the whole length. Either of these latter contingencies can arise through neglectful operating, such as selecting wrong dies or paying insufficient attention to the proportions of scrap being worked away.

A frequent cause of scrapped air bags and inner tubes is the presence of excessive "spider marks," the light places spaced around the section which arise through resistance to reaggregation imposed upon the rubber by the spokes of the mandrel supporting member, or spider. When these fault lines become so marked as to cause air bags to crack internally in service, or inner tubes to suffer inordinately large gage variations, one of 3 circumstances may be responsible: (a) The stock may be insufficiently plastic. (b) The speed of the machine may be too great, preventing aggregation of the rubber within the die-case. (c) The design of the spider may be unsuitable.

Correction of the condition in the first 2 instances should not be difficult. In the third, however, it is not simple to design a mandrel support capable of permitting satisfactory agglomeration of the rubber before reaching the die; so most manufacturers have to rest content with a compromise. Either the spokes of the spider must be disposed so that their effect is felt where least vitiation of the product is possible, or portions of the die or die-center (or sleeve) must be cut away to increase slightly the gage along the fault lines.

Rubber Matrix Material

A NEW application of rubber of interest in the printing trade is its use in a matrix composition for the production of printing plates from engraved surfaces or delicate fabrics, speedily, easily, and of high quality.[1]

The composition employed can be poured cold into a mold or upon a backing sheet. When set, it is of somewhat wax-like character, more or less tough or tenacious, and unaffected by the temperature at which molten metal or alloy for producing printing plates is commonly poured.

The composition is made to the following formula:

Commercial rubber cement	3 lbs.
Carbon tetrachloride	2 lbs.
Benzol	2 lbs.
Chemically pure talcum powder	4 lbs.
Carbon black	½ oz.

These ingredients are mixed in a suitable mill, and, while in a fluid state, the composition is flowed over a metal sheet, pulp board, etc., to which it adheres quite closely. Thus prepared, the coated sheets may be stored for use.

When a matrix or mold is to be produced, a section of the coated stock is impressed with the desired form, pattern, or design. It is then supported and encompassed by guards to receive the molten metal, which is poured upon the composition as in the usual way of pouring stereotype plates. In actual practice cast printing plates have been produced by this process in from 3 to 5 minutes, starting with the backed composition, and perfect impressions have been taken on the composition from surfaces in which the lines or markings showing the design are so slightly out of the common plane that reproduction would be deemed impossible.

Owing to the fact that the composition neither expands nor contracts during or after molding or application to the backing surface, the cast plate reproduces absolutely the original pattern and will fit with precision its place in a press or in a form of which it constitutes part. This is a feature of importance, in that where the plate is to be used as part of a general make-up, difficulty has been experienced in causing it to register or in positioning it to occupy the space intended.

[1] U. S. Patent No. 1,902,048, Mar. 21, 1933.

EDITORIALS

Rubber Industry Code

TO EFFECTUATE the policy of Title I of the National Industrial Recovery Act during the period of the emergency, by reducing and relieving unemployment, improving labor standards, eliminating competitive practices destructive of the interests of the public, employe, and employers, relieving the disastrous effects of over-capacity, and otherwise rehabilitating the business, the various divisions of the rubber industry are preparing, through committees, codes of fair competition to be presented to the NRA administrator.

The code makers have held frequent meetings during the past month with the endeavor to formulate provisions that will fulfill the requirements of the government administrators, and such progress has been made that the complete code will probably be ready for publication before August 1.

Allocation of output is not favorably received by the rubber manufacturers, who are willing to draft a code that will consider the principle of allocation, but will avoid any attempt to allot production of tires and other rubber products among the manufacturers. Allocation should not be attempted until the question of wages, machine output, hours of work, and machine hours have been definitely settled.

The rubber industry code relating to the working week and wage scales, as proposed, is apparently fair. A tentative maximum work week of 36 hours has been set, with minimum wages at 40¢ per hour for men and 28¢ for women and children. Owing to the seasonal character of rubber production, the short week of 36 hours is to be preferred instead of the 40 hours recommended by other industries.

The textile code was made effective July 17, but makers of tire yarns or fabrics were exempted for a period of 3 weeks from the limitation on the use of machinery, to a maximum of 80 hours per week. July 30 is the exemption expiration date.

Modernize Your Plant

MUCH has been said recently about the obsolescence of rubber machinery and the very great need of replacing old equipment with modern machines of greater production efficiency. This timely warning was given several months ago to those manufacturers who, in order to avoid the direct outlay of money, had not brought their mill and calender rooms up-to-date.

It was apparent at that time that any appreciable upturn in the demand for rubber goods would find the owners of out-of-date plants unable to turn out their orders on time or to meet the prices of well-equipped competitors.

That is just what happened recently to one large tire manufacturer. His capacity was rated at 75,000 tires daily; but when output was increased to 55,000 tires, it was found that the limit of production had been reached, as materials could not be delivered fast enough to the building machines. The mill and calender room equipment, it seems, had not been modernized; therefore the present plant was of necessity rerated back to 55,000 tires daily.

Record Rubber Figures

THE consumption of crude rubber by manufacturers in the United States continues to mount increasingly, and during the past month consumption records were broken for all times. For the month of June just passed, 51,326 long tons of crude rubber were consumed in this country by the manufacturers of rubber products. These figures exceed by 2,093 long tons, the former high record of 49,233 long tons that were consumed in June, 1929.

Reclaimed rubber production and consumption have also been doing considerable sky-riding of late. The June consumption of reclaimed rubber is estimated to be 9,674 long tons, which is the high figure recorded since September, 1931, when 8,932 long tons were consumed by United States rubber manufacturers.

Production of reclaimed rubber has also done some spectacular soaring. The figures for June were 10,591 long tons, which is the largest monthly production figure since August, 1931, when 10,110 long tons of reclaimed rubber were produced by United States reclaimers.

Rubber prices have shown surprising advances during the past month. On July 1, spot crude rubber was quoted at 8¼¢ per pound, compared with 10.25¢ on July 17, an increase of 23%.

The advances are due to the heaviest volume of trading ever experienced on the Exchange.

RESEARCH OFTEN JUSTIFIES ITSELF QUITE AS MUCH IN by-products as it does in original purpose. During the working out of the synthetic rubber DuPrene, a synthetic drying oil was discovered that is said to be 15 times as impervious to moisture as linseed oil paint and 5 times that of glyptal resin, and the films are said to be unaffected by all solvents and most corrosives.

What the Rubber Chemists Are Doing

Anode Process

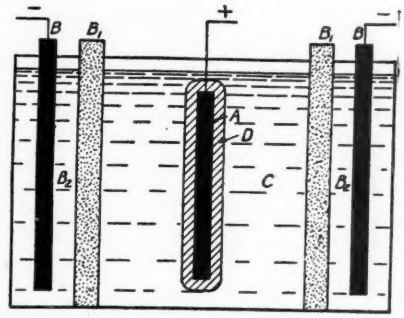
THE following excerpts from a recent scientific treatise on the anode process[1] outline briefly its method and commercial applications.

The term "anode process" has been used widely in the trade to designate a method for the production from rubber latex of articles and coatings of the highest grade of unmasticated rubber.

Rubber latex is composed chiefly of tiny particles of rubber suspended in a water phase or serum, not unlike globules of butter fat in milk. Latex contains small amounts of many organic compounds and inorganic salts. Some of these non-rubber materials, such as the proteins and resins, are considered to be adsorbed on the surfaces of the rubber particles and to be responsible for many of the colloidal characteristics of latex. As it comes from the tree, the latex is unstable and coagulates easily, but, when stabilized with ammonia, it can be safely shipped and stored for long periods.

Like most colloidal particles in suspension in an alkaline medium, the rubber particles of ammoniated latex are negatively charged through the adsorption of hydroxyl anions. The particles, many as small as 1/25,000-inch in diameter, are in constant oscillation (Brownian movement) and are kept from hitting one another and sticking together (coagulating) by the repulsion of their electric charges. When the hydroxyl ions are neutralized, or otherwise removed from the particles, the electric repulsion between particles disappears, and coagulation results.

Since the advent, about 12 years ago, of stable ammoniated latex as an article of commerce, intensive research and development, applied to the problem of producing a method suitable for the commercial production of rubber articles and coatings, have culminated in the development of the anode deposition process. This consists in the deposition of rubber globules and other particles suspended in an aqueous medium (compounded latex, dispersed rubber, or reclaim) upon articles and forms having the capacity of liberating at their surfaces ions which neutralize the anionic charges of the particles.



A—Anode with deposit of latex rubber; B—cathodes; B_1—cathode diaphragm; B_2—cathode compartment; C—latex mix; D—deposited rubber.

Fig. 1. Cell for Anode Electrodeposition on Metal

The 2 principal embodiments of the anode process have been developed by the anode process pioneers[2]. They may be classified as: (1) electrochemical deposition, the anode electrodepôsition process; and (2) electrical-chemical deposition, the anode ionic deposition process. They are discussed in 4 basic U. S. patents[3].

Anode Electrodeposition on Metals

A latex mix adjusted for anode electrodeposition may, for example, contain 35% by weight of rubber and compounding ingredients; about 20 grams per liter of ammonia; and about 30 grams per liter of ammonium, potassium, and sodium salts, the majority of which is ammonium chloride.

The latex mixture is placed in the anode compound of a diaphragm cell (Figure 1). Slightly alkaline water is placed in the cathode compartment. An anode of zinc or galvanized iron is inserted into the latex, and a cathode is placed in the cathode compartment. When a unidirectional electromotive force is impressed across the electrodes, a number of phenomena take place.

Electrolysis of the dilute ammonia and ammonium chloride solutions produces at the cathode bubbles of hydrogen, and in the cathode compartment, lower hydrogen-ion concentration. It also produces at the anode electrochemical solution of zinc, and in the immediate neighborhood of the anode, an increased concentration of hydrogen ions and some zinc ions. The hydrogen and zinc ions which are moving away from the anode react with the hydroxyl ions adsorbed on the nearest latex particles, thus neutralizing the electric charges of those particles. The discharged particles, through their rapid Brownian movement, are immediately brought into intimate contact with one another and stick together, thus forming a compact deposit which adheres to the anode.

The negatively charged particles of rubber and compounding ingredients exhibit electrophoretic movement in the direction of the anode, bringing about a higher concentration of solids in the immediate neighborhood of that electrode.

During continued deposition the electromotive force impressed across the wet coagulated deposit on the anode removes water from it by electroendosmotic action and compacts the deposit until it contains about 40% water.

This water content is sufficient to maintain the electrolytic conductivity of the deposit and permit the deposition to continue. The diaphragm which separates the latex from the water in the cathode compartment is negatively charged, and therefore the portion of the electromotive force which is impressed across the diaphragm causes an electroendosmotic flow of the positively charged water through the porous negatively charged body. Some water is also carried through the cathode diaphragm by the cations H^+, NH^+, Na^+, K^+, etc., all of which are hydrated to some extent. The water transported through the cathode diaphragm during deposition is approximately equal to the difference between the amount associated with the deposited rubber before deposition and the amount still remaining in the deposit.

Thus, through the electrolytic production of coagulating ions and the concentration adjusting facilities of electrophoresis and electroendosmosis, anode electrodeposition may be used for the continuous production of, for example, deposits having 60% total solids from a mix containing 35% total solids without depleting the mix.

Commercial Applications

Many relatively thin rubber articles, such as balloons and gloves, have long been made by the repeated dipping of forms into rubber cement. This method often requires several hours to build up the necessary thickness of deposits and has other disadvantages, such as fire and health hazards, limitations in

[1] "Anode Process for Rubber Articles and Coatings." C. L. Beal, *Ind. Eng. Chem.*, June, 1933, pp. 609-11.

[2] Hungarian Rubber Goods Factory, Budapest, Hungary, and Eastman Kodak Co., Rochester, N. Y.

[3] Sheppard and Eberlin, 1,476,374 (Dec. 4, 1923); Klein, 1,548,689 (Aug. 4, 1925); Sheppard and Beal, 1,589,325 (June 15, 1926); Klein and Szegvari, 1,825,736 (Oct. 6, 1931).

compounding and curing ingredients, and inferior chemical and physical properties. Thin articles can also be made by repeated dipping in latex, but such a multiple dip method also has marked disadvantages, such as the formation of striations and layers, separation of the layers under stress, the entrapment of air, and slow rates of thickness building. For example, it would require a number of individual dips and a like number of drying intervals to produce $^1/_{32}$-inch in thickness. With the anode process, on the other hand, homogeneous deposits free from defects are produced in one application, and the time required for most articles is measured in seconds and minutes rather than in hours.

Anode rubber has extraordinary strength and durability. Tensile and elongation data such as 5,900 pounds per square inch at 970% elongation and 6,700 pounds at 925% are characteristic of anode compounds, but are most difficult to obtain with masticated rubber. Remarkably high tear resistance is exhibited by anode rubber stocks all the way from the uncured state to the point of optimum cure. It has good resistance to wear, abrasion, and corrosive chemicals. The water absorption can be controlled to a value comparable with that of good masticated rubber and much less than that of gum dipped rubber.

Rubber products that are at present being manufactured by the anode process include gloves, balloons, druggists' sundries, fountain pen sacs, bathing caps, rubber overshoes, and many specialties.

For many years engineers have been specifying rubber lined tanks and other types of rubber covered equipment for resistance to severe corrosive conditions and for other specific uses. However, the application of rubber coatings by hand (paper-hanging method) is too expensive for wide use on small odd-shaped articles. Now the anode process has ushered in a new era in which articles of countless shapes and sizes can be efficiently and inexpensively covered with adherent coatings of soft and hard rubber.

A high degree of adhesion to metal and many types of non-metal surfaces can be obtained through the use of Vulcalock (a rubber isomer of remarkable adhesive properties) which can be applied to article surfaces by anode process deposition from water dispersions or by dipping in solvent solutions.

Anode soft and hard rubber coatings are used for such varied purposes as resistance to corrosive chemicals; resistance to wear and abrasion; insulation against electricity, heat, sound, and vibration; and for specific applications.

The Bureau of Standards, as an economy move, has laid off 15 rubber research men with varied experience in 12 different fields. This action is unfortunate as the need of an adequate and sustained program of research at Washington is great.

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Rapid Checking of Rubber Stock Gravity

SPEED in checking the gravity of stocks in mill room production is secondary only to accuracy. With this thought in mind it is found that zinc chloride serves admirably for making standard gravity solutions. Its specific gravity is 2.709, and it is readily soluble in water. The only detriment is the fact that it absorbs moisture from the atmosphere, but this can be overcome by checking the solutions with an hydrometer about every 4 hours.

The following is the general procedure for making the test solution. Add slowly about 5 parts of zinc chloride to one part of water, agitating the liquid until the material dissolves. The solution will be murky white in color and, when cool, will have a specific gravity reading slightly over 2.0.

Add about 3% hydrochloric acid until the solution has a dark, clear color. The solution is then ready for use and can be diluted with water to the desired specific gravity. If 20 test solutions are used, having a range from 1.05 to 2.00 gravity, 100 pounds of zinc chloride should last about 3 months.

For test purposes the solutions are arranged in open-mouth jars, representing the range of gravities from 1.05 to 2.00. Determinations are made in 2 to 4 seconds by dropping cured sample disks from batch mixings into the solution of specified gravity prescribed for that stock. The solution in which the disk floats indicates the gravity of the sample. The accuracy of the test solutions is checked by an hydrometer.

New York Group Exhibit

THE theme of the fall meeting of the New York Group, Rubber Division, A.C.S., to be held October 6 will be "New Uses of Rubber and New Rubber Products." The feature of the meeting will be an exhibit of actual rubber articles obtained from the manufacturers and selected by the Program Committee as representing important developments in new rubber products. Manufacturers of new rubber products eligible to this exhibit are requested to communicate with the chairman of the Program Committee, Bruce R. Silver, New Jersey Zinc Co., 160 Front St., New York, N. Y.

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New Machines and Appliances

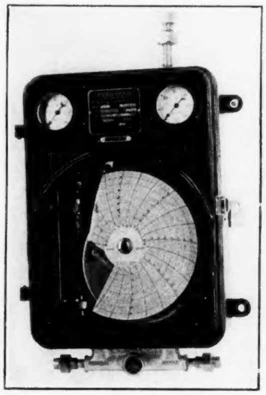


Fig. 1. Free Vane Pressure Time Controller

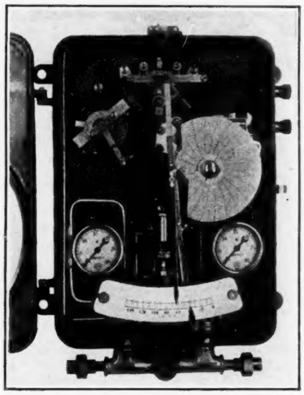
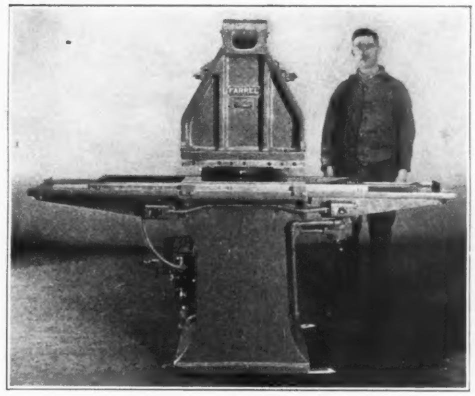


Fig. 2. Indicating Temperature Time Free Vane Controller



Farrel-Birmingham New Type of Pneumatic Gum Strip Press

Time-Temperature and Time-Pressure Controllers

IN MANY processes it is desired to regulate a temperature (or pressure) at some fixed rate and then either hold or decrease it at some other rate. The controllers pictured will do this work on any range of temperature from 140 to 1,000° F. or pressure from 10 to 2,000 pounds.

Figure 1 shows the large cam type controller. The cam here consists of a graduated chart on sheet aluminum that may be cut by the user to give any desired control characteristics. The cam is driven by either a Bristol telechron electric clock or by a high-grade spring clock. Air supply and control gages are mounted self-contained, and the whole is enclosed in a compact moisture-proof aluminum case.

Figure 2 shows a controller similar to the other, except that it is equipped with an indicating pointer which shows the instantaneous pressure or temperature at all times. The cam is of aluminum and is graduated so that the user can cut it for any desired cycle. The use of the free vane principle allows the instrument to control without restricting the indicating pointer at any time. The cam is automatically driven and can be readily changed.

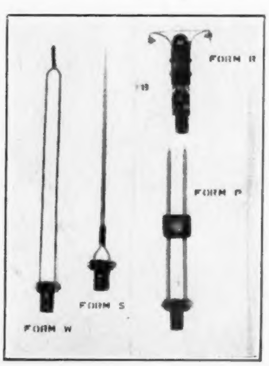
Both instruments will find many applications on process control for eliminating the human element in countless applications. The Bristol Co., Waterbury, Conn.

Gum Strip Press

A NEW type of pneumatically operated gum strip press just announced is designed for applying gum strips to fabric without the use of cement or other adhesives. This machine is a 2-platen press, giving a low unit pressure on the plates. The use of air as the operating medium provides a quick working cycle, as well as a follow-up squeeze; hence this unit combines certain advantages of both mechanical and hydraulic presses. The action of the air cylinder is applied to the moving crosshead or ram by a lever which multiplies the pressure, thus allowing the use of a much smaller air cylinder than would be required on a direct acting press, giving a more compact unit.

The operation of the press is controlled by a motor valve and an adjustable time relay so that by pushing 2 buttons the press closes and remains closed automatically under pressure any desired time from 5 to 40 seconds and then opens automatically to complete the cycle. It will not close a second time until the control buttons are again pushed. Two buttons are used to start the cycle, one at either side of the front of the press, wired in series so that the operator is required to have both hands clear of the platens before the press can be started. A hand controlled valve also is provided so that the press may be operated one step at a time by the automatic control, if desired for special conditions.

Each side of the lower platen has extension tables on which is mounted a light uncovered loading tray with rollers for changing work in and out of the press. Farrel-Birmingham Co., Inc., Ansonia, Conn.



"Alnor" Pyro Point Pyrometer Forms

Pyro Point Pyrometer Forms

A HAND-SURFACE pyrometer for roll surface testing recently mentioned in this journal[1] can be used with any of several contact forms, each designed for use on different types of surface.

Several of these Pyro Point forms are here illustrated. Thus form *P* is a thermo-couple specially adapted to indicate instantly the temperature of clean metallic surfaces. This form is not effective when the metals are dirty, oxidized, or so hard that the points can not make good contact.

When the surfaces to be measured are either metallic or non-metallic and either soft or hard, dirty or clean, the temperature can be indicated by the instrument described last month.

For revolving heated surfaces form *R* is offered. In this assembly a flat ribbon is pressed against the surface. To control the pressure of contact and avoid excessive wear and temperature rise form *R* is provided with a pair of adjustable rollers which come in contact with the revolving roll when the

[1] India Rubber World, July 1, 1933, p. 34.

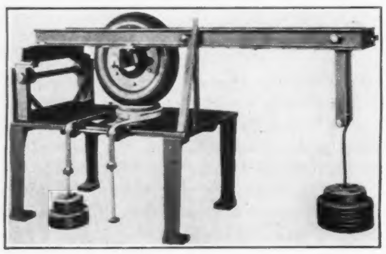
ribbon is pressed beyond its ideal position.

A satisfactory type of thermo-couple for use with rubber and other plastic non-metallic materials is form *S* because it has a long tapering point easy to push into such material as tire casings, etc.

Form *W* is suggested for measuring the temperature of hot liquids and molten metals not under pressure. This form is a wire welded thermo-couple unit which may be attached directly or indirectly to the instrument terminals. Illinois Testing Laboratories, Inc., 141 W. Austin Ave., Chicago, Ill.

Steering Effort Tester

THE machine illustrated reveals among other interesting facts, that the amount of effort required to turn the steering wheel of a car at rest on a pavement increases from zero to a maximum which is reached when the tire and its wheel have been turned through an arc of 11 degrees. In other words no additional effort is required



Steering Effort Tester

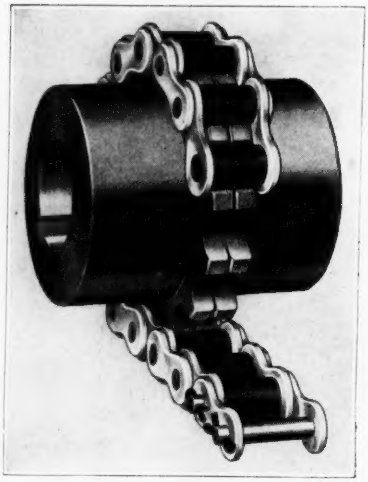
to turn the steering wheel to the limit of its travel.

The apparatus is formed of a table supporting a frame in which a tire may be mounted and weighted with a load equal to that of a car. The tire is held immovably upright with the tread resting on a section of pavement carried in a steel disk. A belt is passed around the rim of the disk, and the ends of the belt are carried over 2 rollers at the front of the table. Weights are added at one end of the belt until the disk is forced to revolve under the tire. The total of the weight used is the measure of the effort needed to turn the steering wheel. In computing the effort, proper allowance is made for steering gear ratio and for friction in the steering gears and elsewhere. United States Rubber Co., 1790 Broadway, New York, N. Y.

Flexible Coupling

THE coupling here represented consists of 2 cut-tooth sprocket wheels or coupling halves and a length of roller chain to connect them. All the working surfaces are machined to close tolerances. A pin and cotter link facilitates coupling or removing the chain when desired.

In connecting a motor shaft to a shaft in line with it this coupling allows for reasonable end float of the

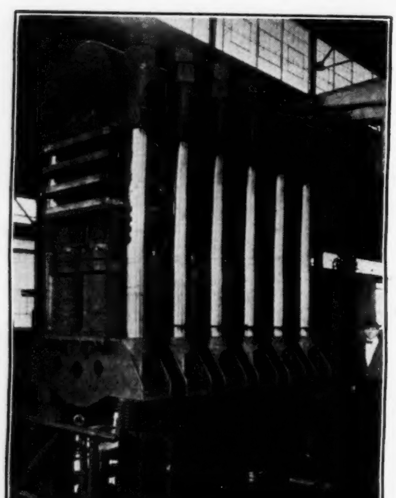


Link-Belt Flexible Coupling

motor. When flexible couplings are installed, they should be accurately lined up as their efficiency and durability are impaired through misalinement, and no flexible coupling should be made to serve as a universal joint. A lack of parallel up to 2 degrees is permissible between the shafts of the 2 elements. Where the operating conditions suggest the advisability of protection from dust, dirt, etc., the life of the coupling can be prolonged by enclosing it in either a stationary or revolving type, self-lubricating, oil retaining case. A casing will also serve as added protection to workmen. Link-Belt Co., 910 S. Michigan Ave., Chicago, Ill.

Vulcanizing Press

THE press illustrated is claimed by its builders to be the heaviest tonnage steam platen press ever constructed. It is of the 3-opening type with 4 steam plates, 48 inches wide by 144 inches long. The construction is steel

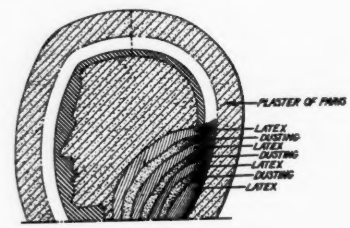


The Heaviest Tonnage Platen Press

throughout with the exception of the semi-steel rams. The columns are special alloy steel showing ultimate tensile strength of over 120,000 pounds from test bars. Under test this press applied the enormous pressure of 10,000 tons on the platens. This pressure was effected by means of 12, 18-inch rams at 6,500 pounds per square inch hydraulic pressure. Under this load the great deflections anywhere in the platens did not exceed 0.004-inch. This deflection is exceptionally low for such a heavy tonnage press and is a good example of exceptional design and workmanship on such a large and massive piece of equipment. Lake Erie Engineering Corp., 68 Kenmore Station, Buffalo, N. Y.

Latex Rubber Mold

FOR many years clay models have been molded in plaster of Paris, glue, or in a combination of both. A new invention[1] makes use of liquid latex to the same ends and claims great superiority in the results obtained and in the life of the mold itself.



Details of Latex Mold

The model or pattern of clay or other substance is repeatedly dipped, sprayed, or coated with a latex solution which has been compounded for vulcanization. Each coating is allowed to dry or is coagulated by acid before the next coat is applied. After the desired thickness has been built up, the whole is vulcanized at low temperature.

If a more rigid type of mold is desired after the first 2 or 3 dippings in the latex solution, the dipping model is alternately dipped in latex and dusted with plaster of Paris. The illustration shows a model covered by latex backed by alternate layers of latex and dusting material and finally backed by a plaster of Paris casing.

In still other instances the plaster of Paris is added directly to the latex solution in the presence of a stabilizing agent and poured. The plaster of Paris utilizes the water in the latex and sets to a homogeneous mass of gypsum and rubber, the mass having some of the characteristics of each component.

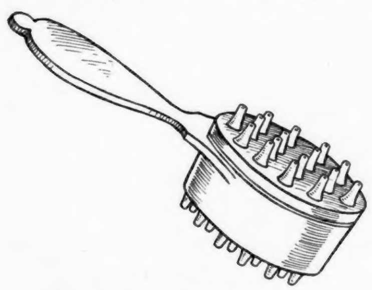
Greater flexibility for the mold, greater ease in removing the cast from the mold, longer life, and the obtainment of a wider variety of compositions for mold construction are among the claims made by the inventor.

[1] United States Patent No. 1,902,627, Mar. 21, 1933.

New Goods and Specialties

Rubber Applicator

MODERN conveniences are constantly being perfected for the fastidious traveler. The latest such product, which will be found quite useful at home, too, is the handy face cream applicator here illustrated. It is made of soft, pliable rubber, easy to carry on trips, and, of course, eliminates the need of taking jars with their attendant danger of breakage. This applicator is always ready for service. All that is necessary, after it has once been filled, is a slight pressure to the face, which releases the desired amount of cream through the raised outlets. Then the applicator is turned over, and the face massaged with the cap side. This



Handy Face Cream Applicator

device, with its convenient handle, is clean and sanitary and avoids smeary hands on the part of the user. Charles A. Wilson, Klickitat, Wash.

Useful Plastic Rubber

A COMPOUND for all-around repair purposes, known as "Frund's Plastic Rubber," can be thinned to any desired consistency by stirring water into it immediately after pressing from the tube in which it comes. This plastic rubber will mend rubber boots, waders, raincoats, rubber mats, tents, awnings, tarpaulins, automobile tops, tires, and leather upholstery. It is said to waterproof any fabric or porous material and can be applied to channels, seams, cracks, etc., to make them weathertight. This product serves also as an adhesive insulation, joint packing, for making rubber gaskets and shapes, and as a water pump packing. It can be used, too, for anchoring rugs and linoleum and will often take the rattles and squeaks out of automobile bodies. Frund Rubber Co., 154 E. Erie St., Chicago, Ill.

Rubber Dust Pan

MORE and more is rubber being utilized in the kitchen to make the housewife's tasks a little easier. Now comes a rubber dust pan, as shown in

Rubbermaid Product

the illustration. It is self-holding, unbreakable, and sanitary, and conforms to floors. This Rubbermaid utensil, like all the others, is made of rubber tiling in 4 colors: green, black, blue, or red with white, all mottled.

Other Rubbermaid kitchenware includes sink scraper, soap dish, sink strainer, and drainboard and general utility mats. The S. & O. Sales Co., 444 W. Exchange St., Akron, O.

Hard Rubber Beer Cooler

EVERYONE knows beer is most unpalatable unless it is cold. But how to keep it cold is a problem, for, after all, the refrigerator can't be used exclusively as a beer-bottle cold storage plant.

But once again rubber comes to the rescue. It is used in the cooling device here illustrated. Fashioned of molded hard rubber, with pebble dash panels and a rich black finish striped with red, it accommodates 6 bottles. A removable ice-cube breaker is provided whereby the ice is crushed, falls, and becomes closely packed around the bottles to

"Lightning" Cooler

make them chill. After the heavily tinned breaker is taken out, the cover is slipped over the container, allowing only the necks of the bottles to remain exposed. For carrying it around anywhere the cooler is given a chromium plated handle.

The manufacturer claims that the beer will become cool in 10 minutes and ice cold in 15. When one bottle is used, another can easily be put in its place. Packed carefully with chipped ice, the "Lightning" Cooler, as it is called, keeps beer cold for motor trips and picnics. North Bros. Mfg. Co., American St., Philadelphia, Pa.

Novel Balloon

THIS plaything of unusual shape is one of the distinctive items of the Hy-Tex line of balloons, made by the

Serpentine Balloon

patented Anode process. Serpentine, as it is called, because its shape resembles that of a serpent, is made in popular colors in 2 sizes: regular, No. 545, which inflates 45 inches in length; and giant demonstrator, No. 684, which inflates 8 feet in length. The Oak Rubber Co., Ravenna, O.

Gasoline Hose

AN efficient rubber covered gasoline hose has been perfected together with a new Permalock coupling specially designed for use in gasoline pump service. The outstanding features of this hose are its high quality metal lining and a special construction feature that prevents rubber from being forced into the convolutions of the metal during braiding and wrapping and eliminates all possibility of rubber getting into the gasoline stream. Braid of heavy quality yarn provides ample bursting strength; while the specially developed tough black rubber cover over the braid will resist severe abrasion. It can be cleansed easily with cloth moistened by gasoline and will not discharge color.

The Permalock coupling is permanently locked into the hose and is not re-attachable. It cannot prevent leakage at joints beyond the coupling, but is designed to prevent gasoline from following down the coupling onto the cover of the hose. Unlike the ordinary cotton jacket type, this new hose is extremely flexible and since water cannot penetrate its cover, it retains the flexibility under all weather conditions. The B. F. Goodrich Co., Akron, O.

Rubber Industry in America

OHIO

Prof. H. E. Simmons

New Akron U. Head

Prof. Hezzleton E. Simmons, of the chemistry department, recently was chosen president of Akron University, formerly Buchtel College, where he was largely instrumental in effecting the establishment of its well-known course in rubber chemistry. Professor Simmons graduated from Buchtel College with a B.S. in 1908 and during his last 2 years there was an assistant instructor in chemistry. Then he went to the University of Pennsylvania, where the master's degree was conferred upon him in 1910. While at U. of P. he served as an instructor, but returned to Buchtel in the Fall of 1910 to become professor of chemistry.

This new college head, a very busy and exceedingly popular man, by no means devotes all his time to teaching. He is also secretary-treasurer of the Rubber Division, American Chemical Society, and but recently resigned as president of the Rotary Club. He belongs also to the Lone Star, Omicron Delta Kappa, and Phi Eta fraternities.

Professor Simmons, who is 47, is married and the proud father of 4 children.

The Aetna Rubber Co., Ashtabula, through President S. T. Campbell announces that it again finds it necessary to step up production in practically all its lines to take care of the immediate demand in advance of the contemplated price increases now being made in the rubber industry.

L. A. McQueen, sales manager for General Tire & Rubber Co., Akron, represented his company at the rubber code-drafting meetings held during last month.

Mechanicals Up

Owing to substantial increases in the cost of raw materials and the uncertainty of the effects of the application of the Federal Recovery Bill on costs and prices, the prices of mechanical rubber goods have been raised, effective July 1, by leading manufacturers including: Boston Woven Hose & Rubber Co., Cambridge, Mass.; The B. F. Goodrich Co., Akron, O., 10 to 30%, depending on the particular product; The Goodyear Tire & Rubber Co., Akron; and The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., Passaic, N. J.

Goodrich Activities

Directors of The B. F. Goodrich Co. met in Akron, July 11, for their first local meeting this year. Attending were President J. D. Tew, Secretary S. M. Jett, Treasurer V. I. Montenyohl, Comptroller T. B. Tomkinson, and Directors A. H. Marks, R. S. Rauch, Sidney J. Wineberg, Wesson Seyburn, Charles S. McCain, and C. E. Sullivan.

Additional employment in the Goodrich factories is expected to continue at the same pace through July that was maintained in June, company officials declare. There were 1,643 workers added to the payrolls during June, following other additions in April and May. The number of employes on the factory payrolls on June 30 was 30% greater than on the same date last year. Increased demand for tires as well as other rubber products has been responsible for the upswing.

George Oenslager, Goodrich research chemist, left on a fishing trip of several weeks starting July 9. He will fish at lakes around Emo, in northern Ontario, Canada.

Fenner, Beane & Ungerleider, 60 Beaver St., New York, N. Y., member of the New York Stock Exchange, the new Commodity Exchange, and other exchanges, recently opened a branch office in rooms 404-407 Ohio Bldg., Akron, for the convenience of its numerous customers in that section. The firm maintains extensive facilities for executing orders in rubber and other commodities.

Industrial Chemical Sales Co., Inc., 230 Park Ave., New York, N. Y., manufacturer of Nuchar activated carbons, on July 10 opened a branch office at 370 W. Broad St., Columbus, in the charge of Richard N. Statham, formerly assistant manager of the firm's Chicago office.

W. E. Crofut, president, The Forest City Rubber Co., Cleveland, recently returned from a business trip to Cuba and Mexico, where he visited distributers handling his company's specialty products. Prior to this trip Mr. Crofut spent 3 months in Europe on a similar mission. The products of The Forest City Rubber Co. are now distributed in practically all the countries of the world. During the past 4 years of depressed business conditions, the business of this company has increased in a large way. June, 1933, was the largest month in volume experienced by the company during its entire 30 years. The first 6 months of the present year also are more than double in volume those of any similar period in the company's history. The firm's response to the depression threat in 1929 was the temporary abandonment of manufacturing the standard lines in which it had been active for many years. Then it concentrated on the development of interesting specialties, known as "Comfort" foot aid products, for distribution in the United States and the Dominion of Canada.

Novelty Rubber Sales Co., 342 W. Market St., Akron, includes among its products rubber badges for conventions.

NEW ENGLAND

Heveatex Corp., Melrose, Mass., owing to the growing demand for latex, has had to add 50,000 feet of floor space to its plant. The company also announces a new departure whereby its specialized facilities and experience are provided for working out through all the experimental stages, complete development projects utilizing latex. The completed process is delivered to manufacturers ready to set up for production. Heveatex maintains branch offices at New York, N. Y., Akron, O., and Chicago, Ill.

National India Rubber Co., Providence, R. I., division of the United States Rubber Co., will increase its Lastex department production facilities 60%, according to Charles W. Rehor, general manager. Additional machinery will be installed, and the working force increased by 300.

Ernest I. Kilcup, secretary and acting treasurer of the Davol Rubber Co., Providence, R. I., recently was elected president of the National Association of Credit Men at its thirty-fifth annual convention in Milwaukee, Wis.

Gould Golf Ball Co., Inc., 522-28 Main St., Wakefield, Mass., manufacturer of golf balls, through President H. I. Gould announces that it now is placing on the market for the trade balata covers and sheet stock. The firm maintains a New York, N. Y., office at 977 Sixth Ave.

Farrel-Birmingham Co., Inc., in its 3 plants, at Ansonia and Derby, both in Conn., and Buffalo, N. Y., starting July 10 increased all hourly wage rates 10%. The normal working hours now are 8 hours a day, 5 days a week, with as little overtime as possible. The night and repair gangs and maintenance department will continue on their former hourly schedule, but, if practicable, will average not more than 40 hours a week. No new help is being hired; employes are being given more work, owing to improving business. The action of the company in increasing rates and adopting the basic 40-hour week is entirely voluntary, and Farrel will do its utmost to cooperate with the national administration in attempting to improve industrial conditions.

Hodgman Rubber Co., manufacturer of Hodgmanized fabrics and rubber specialties, Framingham, Mass., is erecting 2 new buildings adjacent the present plant to increase manufacturing space by over 33⅓%. This move was necessitated by the tremendous demand for Hodgman products during the last few months and by the desire to concentrate all manufacturing facilities at one point, particularly those departments now at Malden, Mass., where sporting goods, rubber bands, and extruded products are made. According to present schedules the new buildings should be completed by September 1.

Lumber Bi-Products, Inc., 702 M. & T. Bldg., Buffalo, N. Y., increased its activities by establishing a Wood Flour Division, recently purchasing the assets of the former New England Mills at Manchester, N. H., which includes a plant covering 6½ acres and 2 railroad sidings accommodating at the same time 12 cars of raw material and 8 of the finished product. The plant at present boasts production of about 1,500 tons monthly. Wood flour, finely pulverized wood refined into various grades, is used as an inexpensive filler in numerous formulas to replace more costly ingredients. Samples will gladly be sent gratis upon request to the company. The president, Myron J. Watson, has been associated with the wood flour manufacturing industry since 1920. Other company executives are Harvey C. Jack, executive vice president, and A. Roth, secretary-treasurer and general counsel. The firm has also a New York, N. Y., office at 2112 Broadway.

The Devon Mills, New Bedford, Mass., of the Goodyear Tire & Rubber Co., operating 3 shifts daily, are now making more tire fabric than ever before in the history of the plant.

MIDWEST

Rubber at the World Fair

Among the most interesting exhibits at the Century of Progress now being held in Chicago, Ill., is that of the Firestone Tire & Rubber Co., Akron, O., the only manufacturer showing tire making at the Fair, thus giving millions of visitors the opportunity to see exactly how tires are made with all the patented processes and tire machinery. First in the production line, for instance, is a huge mixing machine weighing almost 50 tons.

The Firestone display, in a modernistic building at Lief Erickson Dr. and 23rd St., differs widely from the majority in that much of the space is devoted to gardens where visitors may relax and enjoy the beauties of the spectacle. In these gardens is a pool 100 by 15 feet, in which are 6 beautiful dome-shaped fountains of mist-like spray, with a jet of water in the center rising 20 feet. This fountain is the "Firestone Singing Color Fountain," the first of its kind in the world. Voice and instrumental concerts are given day and night by this fountain. Beneath each dome is a battery of colored lights that reflect varied hues and shades upon the misty domes, and these variations of color are synchronized perfectly with the shadings of the musical notes and with the rise and fall of the water.

Overlooking the building and gardens is another feature that is the first construction of its kind. It is a sign 80 feet long. Its shadow planes are placed one upon the other, and the result is an ever changing multi-colored array of gorgeous shadow effects, melting into one another, advancing and then receding.

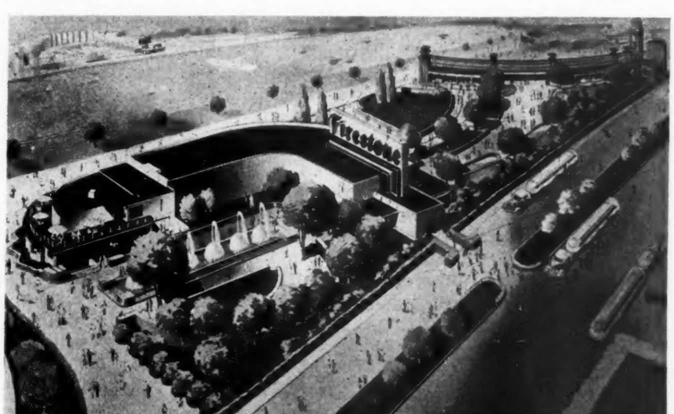
In the Exhibition Hall are the dynamic displays showing by the aid of scientific and engineering development and by electrical devices the marvelous progress that has been made in automotive products and their service to the motoring public. Firestone also has a remarkable racing display including famous cars and trophies. Other exhibits show tire developments, batteries, spark plugs, brake lining, and other Firestone products. Displays of cotton and rubber in all their stages also appear.

In the great hall of "The Hall of Science" Firestone has an educational and scientific rubber exhibit.

Other exhibits having some connection with the rubber industry include those of General Electric Co., Schenectady, N. Y.; Johns-Manville Corp., 292 Madison Ave., New York, N. Y.; Van Cleef Bros., Chicago; and Westinghouse Electric & Mfg. Co., E. Pittsburgh, Pa. Throughout the various buildings may be found Goodyear and U. S. Rubber flooring.

The American Society for Testing Materials held its regular annual convention in Chicago, Ill., during the week of June 26. In conjunction with this meeting was an exhibit of testing equipment. The first such exhibit was held 2 years ago, and the plan was repeated to provide for exhibits of commercial apparatus of manufacturers and distributers and also non-commercial apparatus developed in research, government, and university laboratories, together with exhibits of committee work in the apparatus field.

Carl E. Frick, a member of the executive committee, Chicago Group, Rubber Division, American Chemical Society, strongly urges that those attending the Rubber Division meeting, September 12 to 14, in connection with the A. C. S. convention in Chicago, make hotel reservations now because of the crowded conditions of hotels due to the Century of Progress Exposition. The Rubber Division meeting will be held in the Stevens Hotel, but the banquet will take place in the Bal Tabarin of the Hotel Sherman, which will serve as unofficial headquarters for the rubber men.



Architect's Drawing of the Firestone Exhibit at Chicago

EASTERN AND SOUTHERN — NEW JERSEY

B. van Leer, of Amsterdam, Holland, maker of steel drums, recently visited the United States on a combined business and pleasure trip. Mr. van Leer, accompanied by his son Oscar, attended the Century of Progress Exposition in Chicago and visited various business centers between that city and the Atlantic Coast. Mr. van Leer is introducing a special stainless steel drum for the shipment of liquid latex from Far Eastern and South American plantations. It is known as the "van Leer" drum and is fitted with the patented "Tri-Sure" closure which seals it against leakage and maintains the latex in perfect condition while in transit. Mr. van Leer's company maintains factories in Holland, England, Scotland, Germany, France, and Trinidad, B. W. I., and plans to open depots in the Federated Malay States, Java, and Sumatra, to take care of the increasing demands for the drums from rubber companies in all parts of the world.

Wilson H. Blackwell, treasurer, Latex Fibers Industries, Inc., subsidiary of the United States Rubber Co., 1790 Broadway, New York, N. Y., who suffered injury to his arm in an automobile accident some time ago, has entirely recovered.

The Fourteenth International Exposition of Chemical Industries will be held at the Grand Central Palace, New York, N. Y., during the week of December 4. Charles F. Roth, who has been manager of these biennial events since the first exhibition, stated that to date the show is doing better than normal.

Carlisle Tire & Rubber Co., Carlisle, Pa., through President C. S. Moomy has announced the appointment of G. A. Kaebnick as general superintendent of all production. He has been with this concern for several years and prior to that was with General Electric Co.

The St. Joseph Lead Co., 250 Park Ave., New York, N. Y., is offering new grades of lead-free zinc oxides for the rubber industry. These are known as Black Label No. 27 and Red Label No. 31. They have a very fine particle size and, when used for reenforcing purposes, have slow curing characteristics. These grades are offered where there is a need of high reenforcement.

E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., recently raised the pay of all salaried workers, except those under contract, 10%, effective July 1. Several subsidiaries had previously announced increases, and the policy now has been adopted throughout the company, affecting about 30,000 salaried and payroll employes.

Baird Rubber & Trading Co., Inc., 80 Broad St., New York, N. Y., crude rubber importer and dealer, lists the following executives: Wm. T. Baird, Jr., president; Collier W. Baird, vice president; and Wm. T. Baird, secretary-treasurer.

Blackstone Studios

Jerome Lewine

Commodity Exchange Notes

Commodity Exchange, Inc., embracing the former hide, rubber, metal, and raw silk exchanges, formally opened in its new quarters in the International Telephone and Telegraph Bldg., 81 Broad St., New York, N. Y., on July 5, at 9:45 o'clock. It reports that memberships have increased in value from $900 when the Exchange was formed in May, 1933, to $7,500, the price on July 17.

The first president of this Exchange, Jerome Lewine, is well fitted for that high position, for he has spent a quarter of a century in commodities. He belongs to the New York and New Orleans Cotton exchanges; Liverpool Cotton Assn.; Chicago Board of Trade; and Winnipeg Grain; New York Cocoa, Produce, and Curb; Detroit Stock; and Chicago Curb exchanges, and is an associate member of the United Terminal Sugar Market Assn. Mr. Lewine, who is a senior member of H. Hentz & Co., Hanover Sq., New York, also aided in organizing the 4 exchanges now comprising Commodity Exchange and served on their boards. For the past 4 years he was president of the Raw Silk Exchange. Besides he is a governor of the New York Coffee & Sugar Exchange and of the Association of Stock Exchange Firms.

Gates Rubber Co., Denver, Colo., has appointed J. G. Iler, Charlotte, N. C., sales engineer, as representative in North and South Carolina. V. B. Brookshire, Charlotte, is district representative for North Carolina; while George R. Morgan, Greenville, S. C., is district representative for that state.

S. H. Renton, general manager, Vulcanized Rubber Co., Morrisville, Pa., is spending his vacation along the New Jersey Coast.

New Jersey rubber manufacturers are elated over present business conditions and believe that the improvement will continue. Buying has taken on such a spurt that warehouses have practically been emptied, and jobbers have clamored for more goods. It is believed that higher prices caused the demand for goods at the old rate. Whether this demand will continue remains to be seen. Many rubber workers who had been out of employment for a long time have been called back to their old jobs.

Joseph Stokes Rubber Co., Trenton, now operates 100% capacity with both day and night shifts at both its Trenton and Welland, Ont., Canada, plants. Milton H. Martindell, vice president and secretary-treasurer, resumed his duties after a lengthy illness.

Essex Rubber Co., Trenton, reports indications for a continued busy season. The concern is running normally.

Murray Rubber Co., Trenton, has granted its employes another 5% increase in wages, making a 10% raise during the past few weeks. The company, operating to capacity, has many orders on hand. The labor payroll has been increased approximately 70%, and the number of employes 10%. Murray has offered 18 acres of land adjoining its plant to the City of Trenton as part payment of its $50,000 back taxes. The city desires the ground for park purposes, but has made no decision yet.

Whitehead Bros. Rubber Co., Trenton, continues to operate at capacity. The shoe department also is busy. Superintendent William A. Howell, recovered from a serious illness, has returned to work.

Pierce-Roberts Rubber Co., Trenton, has enough orders on hand to keep the plant going for some time. A double-shift has been utilized.

Luzerne Rubber Co., Trenton, finds that the hard rubber situation has greatly improved since last month. Secretary-Treasurer C. Dudley Wilson, who was seriously ill following an operation in a Trenton hospital, has recovered.

Mercer Rubber Co., Hamilton Square, now running to capacity, has bright future prospects.

Acme Rubber Mfg. Co., Trenton, announces that Vice President and Treasurer John A. Lambert, who has been ill for several weeks, is able to be about again. President Horace T. Cook, who is also president of the Hamilton Rubber Mfg. Co., Trenton, with his wife and children is occupying their summer home on Fisher's Island, N. Y.

The Pocono Co., Trenton, has been operating to capacity for some time. Company officials report enough orders on hand to keep going all summer.

(Continued on page 46)

Rubber Industry in Europe

GREAT BRITAIN

Imported Labor

The Bata Shoe Co., whose works at Tilbury are nearing completion, has applied to the Minister of Labor for permits to admit into England 12 Czechoslovak experts to train the English workers. It appears that the company has certain machines that are not used in English shoe factories; so the British have to be taught the system.

The matter has come up in the House of Commons where it was intimated that labor for the Bata works was likely to consist chiefly of juveniles and persons under 25 years of age from agricultural districts. The question was raised whether the new Bata works were not surplus to the country's present productive requirements. These points have also been raised by the Joint Industrial Council for the footwear industry, representing employers and trade unions, which body is opposing the applications. It is feared that the introduction into England of the Bata system might not only give that company an unfair advantage over British manufacturers, but might also result in a lower wage scale and adversely affect general labor conditions.

Chlorinated Rubber

The unfavorable opinions of Dr. Wilhelm Krumbhaar in his recent lecture, "No Illusions about Chlorinated Rubber[1]," have aroused much criticism.

It may be recollected that INDIA RUBBER WORLD drew attention to much more optimistic Dutch views on the subject, and Philip Schidrowitz in *The India Rubber Journal* also shows certain discrepancies between Krumbhaar's statements, and observations by Dutch investigators, Fol and Bijl. The Dutch opinions, he shows, are very much more favorable with regard to the resistance of chlorinated rubber to water, acids, alkalis, etc., and differ considerably too on the question of the product's stability to heat and light.

From a practical view, Schidrowitz adds, resistance to water is a purely relative question. Thus, viscose is distinctly poor in this respect; nevertheless an enormous silk industry based on it has been developed, and viscose films are widely used for wrapping. He further points out that the last word has not yet been said with regard to chlorinated rubber paint and that its field of application may be considerably increased by further improvements. Finally he suggests that discrepancies between results of different investigators may be due to the variability induced by variable mastication of the rubber used in the chlorinated product.

Oil and Colorman's Journal also prints criticisms from various writers.

One says, "With properly made chlorinated rubber and correct formulation adhesion is excellent and its stability under normal conditions unimpeachable."

According to another ". . . there is no doubt about either the elasticity or flexibility. I have painted paper with paints made with this material and on crumpling it up have been unable to make it split or crack off. As for adhesion, I have painted glass with paints made from chlor rubber and it has been almost impossible to shift it with the nail. . . . It is absurd to say that it will not withstand the action of alkali, for I have made a paint from chlorinated rubber and painted a piece of aluminum all over with 2 coats. I then sank this into a very strong solution of caustic soda, and after 4 days there was no action whatsoever, and on removing the paint with suitable solvents I found that the caustic soda had not had the slightest effect on the polished surface of the aluminum. The same paint stood up equally as well in sulphuric acid. . . . the few practical tests to which I put this material were very successful indeed, and I do think that there are tremendous possibilities."

A third writer found chlorinated rubber excellent and has painted his car with it.

[1] See INDIA RUBBER WORLD, July 1, 1933, p. 49.

British Notes

Streamline fairings for aircraft, made of hard vulcanized expanded rubber, are said to be very light in weight, strong, and non-absorbent of moisture. Hundreds of airplanes have already been equipped with these fairings, including the Vickers "Viastra" monoplane supplied the Prince of Wales.

Reconstruction plans, including reduction of the share capital and provision of additional working capital, are announced by the India Rubber, Gutta-percha & Telegraph Works Co., Ltd. The company is at present capitalized at £1,000,000, of which £250,000 are in 5% preferred shares, and the balance in common shares, all of £1 each. It has paid no preferential dividend since 1930 and has a debit balance of £212,649.

The Propaganda Committee of the Rubber Growers' Association in cooperation with the Milford Docks Co. has arranged tests with rubber linings for coal chutes. This company has also agreed to test a new method of using rubber in lining hoppers especially designed to prevent abrasion and breakage of friable materials like coal.

Russia

Apparently the extensive works of the Russian rubber-asbestos combine Jarak at Jaroslawl have finally been completed. Construction was started in 1929, and the costs are said to have reached 350,000,000 rubles. It is expected that the output of the various factories will reach 28,000,000 rubles this year. So far, however, progress has been slow chiefly owing to the defective methods of delivering raw materials and insufficient steam supply. During the early part of the year the tire factory produced 90,000 tires; whereas the annual capacity is placed at 4,300,000 automobile tires and 3,000,000 other tires. When in full production the output of the rubber soles factory should be 25,000 tons, but the 1933 program provides for 11,000 tons. The 2 textile factories are to supply together 18,000 tons of tire fabric annually; the 2 reclaim factories 20,000 tons of regenerated rubber; the first of the latter, working since October, 1932, is expected to produce 4,500 tons this year.

Besides these new factories, there are, of course, the older ones: in Leningrad the Treugolnik which in 1931 employed 34,400 persons, in Moscow the Bogatyr with 15,000 employes, Kautschuk with 3,200, and Prowodnik with 900 workers; in all 53,500, which compares with 24,600 in 1913. These factories produced 53,000,000 pairs of footwear in 1931 against 38,900,000 pairs in 1913.

Latest figures show that Soviet rubber business has been declining. While imports of crude rubber rose from 28,210 in 1931 to 30,530 tons in 1932, the imports for the first quarter of 1933 were 6,578 against 6,955 tons in the same period in 1932. Exports of footwear were 1,665 tons, value 3,500,000 rubles in 1931; 1,569 tons, value 2,400,000 rubles in 1932; and 186 tons, value 379,000 rubles the first quarter, 1933.

As to the rubber planting program, after all the talk, the most important problems that the scientists of the plantation trust will have to solve in 1933 are the organization of the provision of seed and the discovery of suitable climatic and soil conditions.

GERMANY

New Processes

Exceptional properties are claimed for a lacquer-like coating for rubber products, which consists of gutta percha or balata solutions or dispersions, with or without other ingredients. After the solvent or dispersion agent has evaporated, the coating is cold cured. The cold cure may be accelerated by heating[1].

Linoleums superior to the usual types result when plastic, non-crumbling synthetic rubber is used as the binding agent. The binding power of this synthetic rubber is so great that considerably smaller quantities of linoxyn are required. The addition of sulphur and accelerators permit the linoleum to be vulcanized, thereby still further increasing the durability, resistance, and elasticity of the product, it is said.

Fast colored articles are obtained from latex or other aqueous rubber dispersions according to a recently patented process by Metallgesellschaft A.G., it is claimed. The color is first thoroughly milled in the rubber or reclaim; then the mix is dissolved in benzine or other solvent, and, if necessary, an anti-coagulant is added. This solution next is mixed with the aqueous rubber dispersion or the latex, and the water is evaporated, leaving a uniformly colored film in which each particle of the color is coated with a thin rubber layer which protects the color from the action of water. It is further claimed that considerably less color is necessary to obtain a given shade than is usual; while the dispersion so colored can be used for dipping, spreading, and spraying.

Non-skid rubber, particularly suited for tire treads, is prepared by mixing metal particles with the rubber compound. To insure perfect binding of rubber and metal, metallic powder is first combined with hard rubber. Various methods are suggested for doing this work; for example, iron chips are first either coated with a hard rubber solution and then incorporated in the main compound or first mixed with a hard rubber compound and finally worked into the rubber mass.

1 German Patent No. 573,885, Metallgesellschaft A.G., Frankfurt a.M.

German Notes

The New York Hamburger Gummiwaren Co., which holds ⅔ of the shares of the Deutsche Tornesit G.m.b.H., reports a loss of 484,202 marks for 1932. Sales volume had considerably decreased during the greater part of the year, but special measures have been taken to maintain sales and to enable the company to work without loss.

Fromms Act Gummiwerke G.m.b.H., Berlin, has just been registered with a capital of 200,000 marks to take over the factories and business of the concern Fromms Act, Julius Fromm, which formerly belonged to Julius Fromm. The new concern will be managed by Karl Lewis and Berthold Viert.

Harburger Gummiwaren Fabrik Phoenix A.G., Harburg-Wilhelmsburg, reports a loss of 3,383,644 marks for 1932. The previous year a loss of 1,234,981 marks was booked. To put the concern on a sounder basis it is proposed to reduce the ordinary capital of 7,200,000 marks in the proportion of 10:3.

The Kautschuk Gesellschaft m.b.H., Frankfurt a.M., will now undertake all operations in connection with the production, manufacture, and trade in rubber in any form, for account and under directions of the Metallgesellschaft A.G., Frankfurt a.M.

The Warner Bros. Co., G.m.b.H., Hamburg, is the first German firm to use latex thread in making corsets. Their products will be marketed under the trade-name Traumlastic (Dreamlastic) since the name Jugendlastic (Youthlastic) has already been registered by another German firm for its own purposes.

Other European Notes

Hungary's imports of rubber manufactures continued to decline during 1932, having been 3,418 quintals, value 1,840,000 pengo, against 8,986 quintals, value 5,130,000 pengo, in 1931 and 11,938 quintals, value 7,890,000 pengo, in 1930. (Pengo=$0.2367. Average rate in dollars, July 3-8.)

According to recently published figures, Czechoslovakia imported in 1932, 10,198 tons of rubber, gutta percha, etc., of which 583 tons were re-exported. The main imports were pneumatic tires for cycles, numbering 292,509, and others, totaling 227,485. Packing imports were 10 tons, and belting 24 tons. There were in addition 32,785 pairs of overshoes and 44,114 pairs of other rubber shoes; 90 tons of hard rubber armatures for technical and electrical purposes; and 31 tons of soft rubber toys. Among the exports were 202 tons of rubber thread; 33 tons toys; 45 tons belting; 8,214 pneumatic tires for cycles; 1,814 other pneumatic tires; 415 tons of other soft rubber goods; and, most important of all, 474,811 pairs of overshoes, 14 tons of heels, and 5,055,670 pairs of other shoes.

Etablissments Hutchinson proposes a dividend of 90 francs a share on A shares and the statutory 5% on B shares to be paid out of the net profits of 12,811,945 francs for 1932-1933.

Working under the name Manufacture Française du Caoutchouc Eponge Flex à Cellules d'Air, Mr. Leeson, inventor of the Sorbo rubber sponge process, will produce at the works of Etablissments Paul Paillet Asnières (Seine), France, sponges, heels, soles, sheets, cushions, mattresses, etc., identical with those produced by the Sorbo factories in England. The products made in France will be marketed under the trade mark Flex.

The Dunlop company in France reports net profits of 3,153,350 francs and will declare a gross dividend of 25 francs on the old shares and 6.25 francs per share on the new shares.

A 20-ton hydraulic crude rubber cutter capable of slicing with ease blocks of rubber 2½ by 2 by 2 feet into ⅜-inch slices or smaller has just been put on the market by the Engineering Works of Theodore Bell & Co., Kriens-Lucerne, Switzerland. The cutter is of simple design and easy to manipulate; it operates at 50 to 100 pounds' pressure per square inch, but, if required, can also be equipped for high pressure.

NEW JERSEY

(Continued from page 44)

Puritan Rubber Co., Trenton, announces that last month was the most successful during the past 2 years. The company is now operating with a night shift and has plenty of work ahead.

Manhattan Rubber Mfg. Division, Raybestos-Manhattan, Inc., Passaic, has let a contract for a one-story factory addition, 30 by 90 feet, to cost $28,000.

Thermoid Notes

Sales of the Thermoid Co., Trenton, and wholly owned subsidiaries for June increased 31% over May, 1933, and 60% over the same month in 1932. Sales of the 95% owned subsidiary, Southern Asbestos Co., gained about 20% during June over May, 1933, and over 40% for the same month in 1932.

"Our business with the automotive industry has usually tapered off during July," observed President Robert J. Stokes, "but this year the demand has been well sustained, and business at the moment is very satisfactory and looks up for July and August, which is contra-seasonal."

Mr. Stokes, accompanied by his family, is spending his vacation along the Massachusetts Coast.

Thermoid has pensioned George W. Voorhees, who has been employed for 50 years and 7 months by that concern and its predecessor, the Trenton Rubber Co. He was presented with an amethyst ring and smoking set by his associates at the plant. Mr. Voorhees joined the Star Rubber Co., now the Empire Tire & Rubber Co., after graduating from school and later went with the United & Globe Rubber Co. With Thermoid he was made foreman and later became employment manager and general assistant to the factory manager.

Rubber Industry in Far East

NETHERLANDS EAST INDIES

Buddings

Various drawbacks of buddings were enumerated by J. van Wamel during a talk at a recent planters' meeting. He is not exactly opposed to buddings, but his experience makes him doubtful, not to say fearful. In selecting mother trees for buddings, he says, productivity has been the main consideration, and the danger is that high productivity has so frequently been accompanied by abnormal and diseased conditions of the trees which become apparent only after years. Thus it frequently happens that even after years of observation, during which they have given exceptional yields, mother trees suddenly run dry, and it develops that another mistake has been made. Mr. van Wamel gives an instance of an estate which at one time had 160 mother trees, but after 15 years not one was left, and he fears that a large proportion of the earlier buddings especially were derived from such trees.

Continuing, he points out that almost every clone has some defect; nevertheless if such a defect does not constitute a danger to tapping or growth, the clone is usually approved, for output is the main consideration. But these very defects that are overlooked make so much trouble. Buddings usually require more care than seedlings; they are more susceptible to disease and damages due to wind because, on the whole, a budding is a weaker tree. Frequently diseases attack the stock at the union so that buddings develop slower than seedlings.

Tapping buddings offers various difficulties not encountered with seedlings. The bark is much thinner, sometimes only 3 mm. thick for various Avros clones now being tapped on his estate, against 8 mm. for seedlings in the same section. The thinner bark necessitates much more careful tapping. Again each clone has special bark characteristics so that it has to be tapped differently; this work is particularly troublesome where various clones are planted together.

Buddings apparently can not be planted so closely as seedlings. Where they are planted too close, stripe canker is prevalent. In a section where the stand is 400 trees per bouw (bouw equals 1.74 acres), 90% of the buddings were attacked against less than 15% of the seedlings, and with 300 trees per bouw, the incidence was 70% for the buddings and 10% for seedlings.

A tapping wound on a budding takes longer to heal than on a seedling and is more frequently the seat of woody growths.

All these considerations lead van Wamel to question whether budding has not been overdone and whether it is not time to turn back to seedlings derived from selected seed and more particularly seed from isolated budded gardens. In support of his stand he gives results of test tappings showing that such trees give outputs which compare more than favorably with those from clones.

In the discussion following this lecture van Wamel's pessimism was criticized. One planter, stating that his own experience had not been so unfavorable as van Wamel's, pointed out that if 200 instead of 300 to 400 buddings were planted per bouw, the buddings would be more satisfactory, especially as regards bark thickness. Whereupon a general discussion of planting distances for buddings followed, which led to the conclusion that the minimum number of trees per bouw laid down by Tengwall for unselected seedlings was far too high for buddings, a conclusion which would seem to confirm van Wamel's contention that buddings are much weaker than seedlings and require more careful treatment.

Dr. Hoedt, who was also present, declared it was the chief endeavor of the experiment stations to find healthy mother trees, that clones are carefully observed before they are approved, and that as soon as one shows undesirable characteristics, it is no longer recommended. There was no scientifically grounded cause to suppose that the future for buddings was bad. Even if buddings came from sick and abnormal trees, as has been claimed, he said, why should they not be planted if during their existence of, say, 25 years they yield about 4 times as much as healthy, normal seedlings during a life of possibly 50 years.

Van Wamel's scepticism is probably due to the fact that there are as yet no records to show that buddings can give this yield; while meantime the question arises whether the reduction in costs due to higher yields will not be largely offset by other costs due to the extra care which his experience shows him buddings require.

Restriction Pros and Cons

That the Dutch producers are leaning more toward restriction is abundantly evident from the local press. Never before has there been so much discussion of ways and means. New propositions come in regularly, but however attractive the best of them sound on paper, it is hard to believe that in practice they will prove both acceptable to producers and, what is more important, workable.

Take a recent scheme that provides for the prohibition of all further planting for the next 4 years. Considering consumption, the stock situation, and the fact that the potential output of rubber for 1934 is put at 1,400,000 tons, this provision represents sound common sense. Yet it is easy to imagine the agitation among producers—leaving natives out of account—if the government set about enforcing this rule. This same scheme further requires the formation of a government buying and selling committee which would take up all rubber offered during a period of 8 to 9 months, during which there would be no exports, but a fixed price would be turned out by this body; and finally it demands the absolute prohibition of all exports not shipped through the above committee—a very tall order which does not sound easy to carry out.

Again the chances for restriction are not improved by the insistence of some producers that Indo-China join the scheme. Then, of course, there is native rubber. Recently a member of the People's Council, himself a native, went to Sumatra to investigate personally the possibility of enforcing restriction among the small holders there. He came back convinced that proper control was impossible.

Another thing that must be taken into account is that there is a tendency among certain British producers to regard every move of the Dutch with suspicion; while others, pointing to the large decrease in Dutch outputs during the slump, whereas Malayan outputs have substantially been maintained, feel that the advantage lies with the British, and this too affects their attitude to a certain extent. All this, naturally, does make for harmony among the various interests.

Finally, a number of powerful concerns still are as much opposed to restriction as ever. Yet it is said that the chance for restriction is better now than it has been for some time.

Increased Production in Borneo

The rise in the price of rubber has led to renewed activity in tapping in Dutch Borneo, and thousands of piculs (picul equals 133⅓ pounds) of native rubber from the interior are reaching the port

of Bandjermasin to be bought by Chinese for exportation to Singapore. The local bazaar is humming with activity, and there is great optimism all around due also to the fact that not only rubber, but jungle products as rattan, damar, etc., are also fetching better prices at Singapore.

World Rubber Absorption—Net Imports

	Long Tons—1933		
CONSUMPTION	Mar.	Apr.	May
United States ...	18,047	26,226	44,580
United Kingdom..	4,498	7,272	7,627
NET IMPORTS			
Australia	1,904	1,580	425
Austria	196	196	196
Belgium	952	882	...
Canada	1,114	555	1,704
Czechoslovakia ..	688	400	...
Denmark	66	146	170
Finland	60	61	117
France	6,093	6,308	4,144
Germany	4,425	4,805	4,622
Italy	1,604	2,215	...
Japan	6,035	5,495	5,289
Netherlands	282	163	525
Norway	184	92	74
Russia	2,088	...	...
Spain	340	281	433
Sweden	339	307	175
Switzerland	106	32	33
Others	*1,450	*1,450	*1,450
Totals	50,471	...	...
Minus U. S. (Cons.)	18,047	26,226	44,580
Total foreign......	32,424	...	...

*Estimate. *Compiled by Rubber Division, Washington, D. C.*

Foreign Trade Information

For further information concerning the inquiries listed below address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.

No.	Commodity	City and Country
*4,716	Tires and tubes.......	Luxemburg, Luxemburg
†4,720	Tires	Korcha, Albania
†4,727	Tires and tubes........	St. Vincent, Cape Verde Islands
*4,733	Nonvulcanized rubber for manufacture of cliches	Leipzig, Germany
*4,736	Raincoat materials.....	Buenos Aires, Argentina
*4,741	Rubber stoppers	Chiasso, Switzerland
†4,770	Surgical specialties ...	Caracas, Venezuela
†4,802	Balloons	Prague, Czechoslovakia
†4,803	Hose	Alexandria, Egypt
†4,826	Carbon black and rubber sponges	Warsaw, Poland
*4,832	Transmission and conveyer belting	Valencia, Spain
†4,854	Carbon black	Sydney, Australia
†4,874	Rubberized fabrics and druggists' sundries..	Rio de Janeiro, Brazil
†4,876	Lithopone, titanium oxide, and zinc oxide for rubber and paint industries	Toronto, Canada
†4,877	Water bottles, fountain syringes, nipples, and gloves	Tjentsin, China
*4,902	Paper varnished on one side and rubberized on the other, used in corking bottles ...	Paris, France
†4,903	Driving belts	Prague, Czechoslovakia
*4,923	Balloons	Prague, Czechoslovakia
†4,927	Pneumatic boats for hydroplanes	Chatou, France
*4,968	Power-transmission belts	Leipzig, Germany
†5,013	Surgical and household gloves and other druggists' sundries..	Prague, Czechoslovakia

*Purchase. †Purchase or agency.

MALAYA

The Question of Costs

Sir Eric Geddes' statement at a recent meeting of the Dunlop Rubber Co. that planters who cannot deliver rubber at 2d. a pound f.o.b. Singapore are in a difficult position caused much discussion in Malaya.

One planter pointed out that such cost can only be maintained at the expense of the employes. Quit rents have been halved temporarily, and other overhead has been reduced at present; while maintenance work on estates has been cut to a minimum. This 2d. a pound cost is thus not a true economic cost, but has been forced on the plantation industry by circumstances; and future costs will have to be higher if employes and estates are not to suffer.

This point of costs and salaries has been taken up by various writers because it is feared that companies will seek to maintain emergency rates of pay for the European staff even after conditions in the industry improve. *The Straits Times,* although it feels that the estate that cannot produce at 2d. a pound is doomed, nevertheless takes a strong stand against exploitation of planters and severely condemns the attitude that would keep costs low at the expense of the planters. For the good of its own reputation, it says, the Rubber Growers' Association should immediately institute an inquiry into the whole question of salaries.

Returning to Dunlop costs, a well-known planter suggested that Dunlop owns estates having high costs. To this remark the resident director of Dunlop Plantations, Ltd., replied confirming Sir Eric, adding that the cost might seem impossible to short-sighted and old-fashioned planters, but was nevertheless a fact. However the planter in question retorted with some interesting statements on bud grafting.

Said he, "We have it from reliable sources that those who did not jump at this new method immediately are rather fortunate as many of the original buddings have turned out failures. Personally, I am close to the more advanced stage where I consider those who bud old-fashioned and I can prove a yield of 900 pounds per acre from 7½-year-old rubber that was not budded and which has only been tapped for 3 small months. Such rubber promises to come up to the standard of the highest yielding budded rubber."

It is worth noting that more than one Malayan planter is opposed to budding and in support of his attitude quotes excellent yields from selected seedlings. Java, too, has planters who report very good yields from seedlings. Not much attention has hitherto been paid to such statements, but they are certainly worth investigation, particularly if, as has often been claimed, buddings are very risky and require more expense in upkeep than seedlings, for then good seedlings might very well prove a better investment in the end.

Rubber Forestry

Chermang Development, Ltd., is undertaking a new departure: planting a new clearing of 200 acres under modified forestry methods. Some idea of the system may be gathered from the following description from *The Straits Times.*

First the jungle is felled and burned sufficiently to allow easy entrance. The planting rows should be thoroughly cleaned. The planting is done with seeds to have plants without injured roots and thus guard against root disease. There should be about 500 to 1,000 trees per acre to establish a closed canopy as quickly as possible.

Planting should be done immediately after burning to give the seedlings a start before the jungle growth begins to migrate into the areas. The jungle growth between rows is cut back if it encroaches on the rubber, and only grasses, other than lalang, and other herbaceous plants are allowed along the rows between the trees. In this way excessive erosion from rains is prevented. If desired, budding operations can be carried out in the second year.

Malayan Notes

An experimental stretch of road in Raffles Place, Singapore, has been surfaced with a plastic mixture consisting of latex and various fillers and chemicals. It is proposed to lay an additional stretch at Kuala Lumpur for the Rubber Research Institute of Malaya, which is engaged in research work on the use of latex for road materials. It may be added that the R. G. A. Technical Research Committee is carrying out its own scheme in this direction.

Continuing its rejuvenation program the Straits Rubber Co. has had 393 acres of older rubber cut out and replanted during 1932. In addition 17 acres formerly used as nurseries were planted up, and a further 63 acres of old rubber were cut out to be replanted during 1933.

The Labu Rubber Co. recommends a dividend of 2½%. If this is approved, the company's record will then be 26 years of dividends with but one break, in 1931.

The accounts of the Kuala Pertang Syndicate (rubber) for 1932 show a loss of £816 (against £3,656), and after allowing for depreciation the directors recommend that the balance of £14,083 (against £15,818) at credit of profit and loss be carried forward. Sales of rubber have been made for the current year at the equivalent of 3.10d. per pound, landed London.

Patents and Trade Marks

MACHINERY

United States

1,912,374. **Extruder.** E. H. Johnson, Putnam, Conn.

1,912,459. **Manhole Flange Vulcanizer.** J. I. Meade, Butler, N. J., assignor to American Hard Rubber Co., New York, N. Y.

1,912,526. **Foxing Cementing Machine.** F. D. Kinney, Southbridge, Mass., assignor to United Shoe Machinery Corp., Paterson, N. J.

1,913,017. **Paper Treating Device.** E. P. Arpin, Jr., assignor to Nekoosa-Edwards Paper Co., both of Port Edwards, Wis.

1,913,126. **Repair Vulcanizer.** G. K. McNeill, assignor to Morgan & Wright, both of Detroit, Mich.

1,913,327. **Hose Apparatus.** G. H. Barnes, Jr., Silver Lake, assignor to Goodyear Tire & Rubber Co., Akron, both in O.

1,913,336. **Tire Bead Apparatus.** W. E. MacMonagle, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,913,348. **Tire Stitcher.** E. G. Templeton, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,913,374. **Collapsible Chuck and Tire Former.** A. J. Dexter, Springfield, assignor to R. W. Boyden and C. A. Dana, receivers for Fisk Rubber Co., all of Chicopee Falls, all in Mass.

1,913,419. **Cord Terminal Manufacturing Apparatus.** N. H. Watts, Alameda, Calif., assignor, by mesne assignments, to General Electric Co., Schenectady, N. Y.

1,913,747. **Mold.** L. G. Copeman, assignor to Copeman Laboratories Co., both of Flint, Mich.

1,913,927. **Tire Compressor.** A. T. Johnson, Revloc, Pa.

'‚913,995. **Tire Building Apparatus.** H. F. Schippel, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,914,474. **Tire Retreading Mold.** H. J. Woock, Lodi, and C. J. Peterson and J. S. Caufield, both of Sacramento, all in Calif., assignors, by mesne assignments, to Super Mould Corp., Reno, Nev.

1,914,487. **Tire Forming Apparatus.** A. G. Carter, assignor to Carter Products Co., Inc., both of Grand Rapids, Mich.

1,914,528. **Cutting Fork.** F. G. Reid-assignor to Dunlop Tire & Rubber Corp., both of Buffalo, N. Y.

1,914,689. **Extrusion Press.** W. E. Humphrey, Jeannette, Pa., assignor to Pennsylvania Rubber Co., a corp. of Pa.

1,914,853. **Tire Repair Vulcanizer.** L. O. Grange, assignor to W. J. Jarratt, both of Chicago, Ill.

1,914,985. **Testing Device.** E. G. Thomas, assignor to Toledo Scale Mfg. Co., both of Toledo, O.

1,915,061. **Stock Rack.** C. W. Leguillon, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,915,147. **Tire Building Apparatus.** E. H. Barder and C. W. Leguillon, both of Akron, O., assignors to B. F. Goodrich Co., New York, N. Y.

1,915,259. **Magnetic Separator.** H. W. Harman, Wauwatosa, assignor to Magnetic Mfg. Co., Milwaukee, both in Wis.

1,915,644. **Vulcanizer Circulating System.** R. W. Brown, assignor to Firestone Tire & Rubber Co., both of Akron, O.

Dominion of Canada

330,928. **Inner Tube Apparatus.** Goodyear Tire & Rubber Co., assignee of R. W. Snyder, Akron, O., U. S. A.

330,932. **Heel Making Apparatus.** Goodyear Tire & Rubber Co., assignee of W. Fischer, both of Akron, O., U. S. A.

330,933. **Tire Mold.** Goodyear Tire & Rubber Co., assignee of E. Clark, both of Akron, O., U. S. A.

331,140. **Sheet Material Separator.** Mishawaka Rubber & Woolen Mfg. Co., assignee of R. R. Hunt, both of Mishawaka, Ind., U. S. A.

331,209. **Vulcanizing Press.** B. De Mattia, Clifton, N. J., U. S. A.

331,296. **Tire Shaper.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of A. O. Abbott, Jr., Detroit, Mich., U. S. A.

331,305. **Tire Core Mounting Apparatus.** Firestone Tire & Rubber Co. of Canada, Ltd., Hamilton, Ont., assignee of H. D. Stevens, Akron, O., U. S. A.

331,306. **Tire Builder.** Firestone Tire & Rubber Co. of Canada, Ltd., Hamilton, Ont., assignee of H. D. Stevens, Akron, O., U. S. A.

United Kingdom

389,331. **Goods from Rubber Dispersions.** Accumulatorenfabrik A. G., Berlin, Germany.

389,591. **Lace Tip Mold.** Z. Neumann and A. Ney, Budapest, Hungary.

390,163. **V-Belt Apparatus.** Goodyear Tire & Rubber Co., Akron, O., U. S. A.

Germany

578,328. **Loading Device for Hose Presses, Etc.** Electrical Research Products, Inc., New York, N. Y., U. S. A. Represented by B. Kugelmann, Berlin.

579,746. **Device for Automatically Unrolling, Measuring, and Cutting Fabric.** Dunlop Rubber Co., Ltd., London, England. Represented by R. and M. M. Wirth, C. Weihe, and H. Weil, all of Frankfurt a.M., and T. R. Koehnhorn, Berlin.

580,024. **Vulcanizer Heating Arrangement.** Continental Gummiwerke A.G., Hannover.

PROCESS

United States

1,912,591. **Rubber Compounding.** R. R. Olin, assignor of ½ to C. P. Hall, both of Akron, O.

1,912,641. **Colored Article from Aqueous Dispersions.** R. G. James, Birmingham, and D. F. Twiss, Wylde Green, both in England, assignors to Dunlop Rubber Co., Ltd., a British company.

1,912,807. **Rubber Article.** G. Venosta, assignor to Societa Italiana Pirelli, both of Milan, Italy.

1,913,014. **Colored Rubber-Like Article.** F. C. Van Heurn, Amsterdam, Netherlands, assignor, by mesne assignments, to Flintkote Corp., Boston, Mass.

1,913,328. **Shoe Repair Material.** R. R. Bollman, Mount Washington, and C. L. Ornes, Cincinnati, assignors to Perfect Mfg. Co., Cincinnati, all in O.

1,913,330. **Tread.** C. L. Brickman, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,913,422. **Building Pneumatic Tires.** G. F. Wikle, Milwaukee, Wis., assignor to R. W. Boyden and C. A. Dana, receivers of Fisk Rubber Co.

1,913,454. **Inflatable Ball.** B. Predmore, assignor to Seamless Rubber Co., Inc., both of New Haven, Conn.

1,914,040. **Tire.** R. C. Pierce, assignor to National-Standard Co., both of Niles, Mich.

1,914,148. **Elastic Article.** G. B. Meagher, Chicago, Ill., assignor to Kendall Co., Boston, Mass.

1,914,962. **Pile Fabric.** P. S. Smith, assignor, by mesne assignments, to Lea Fabrics, Inc., both of Newark, N. J.

1,915,587. **Ball.** G. C. Worthington, assignor to Worthington Ball Co., both of Elyria, O.

1,915,660. **Driving Belt.** J. R. Gammeter, Akron, O., assignor to International Latex Corp., Rochester, N. Y.

1,915,668. **Pneumatic Tire.** C. G. Hoover, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,915,828. **Mottled Rubber Article.** F. H. Lane, Birmingham, England, assignor to Dunlop Rubber Co., Ltd., a British corporation.

1,915,882. **Attaching Rubber Plates to Leather.** K. Ehmke, Hamburg, Germany.

1,915,963. **Pneumatic Tire.** E. F. Wait, assignor to Firestone Tire & Rubber Co., both of Akron, O.

Dominion of Canada

330,989. **Rubber Latex Processing.** Western Electric Co., Inc., New York, N. Y., assignee of A. R. Kemp, Westwood, N. J., both in the U. S. A.

331,544. **Upholstery.** Dunlop Rubber Co., Ltd., London, England, and Anode Rubber Co., Ltd., St. Peter's Port, Channel Islands, assignees of W. G. Gorham, Birmingham, England.

United Kingdom

388,398. **Driving Belt.** J. Dawson & Son, Ltd., and J. Dawson, both of Lincoln.

388,517. **Rubber Binding.** H. Schoening, Berlin, Germany.

389,403. **Cable.** L. Mellersh-Jackson, London. (Siemens & Halske A. G., Berlin, Germany.)

389,531 and 389,532. **Electrophoretic Deposition of Rubber.** Dunlop Rubber Co., Ltd., London; Anode Rubber Co., Ltd., St. Peter's Port, Channel Islands; and D. F. Twiss and E. A. Murphy, both of Birmingham.

389,765. **Stencil.** J. Kessel, Krefeld, Germany.

389,770. **Coloring Rubber.** Magyar Ruggyantaarugyar Reszvenytarsasag, Budapest, Hungary.

389,833. **Upholstery Material.** G. W. T. Leeson, B. Wrigley, and Sorbo Rubber-Sponge Products, Ltd., all of Surrey.

390,025. **Chlorinating Rubber.** New-York Hamburger Gummi-Waaren Co., Hamburg, Germany.

390,324. **Photographic Process.** E. P. Mullan, Bala, Pa., U. S. A.

Germany

578,296. **Dress Shields.** Gummiwarenfabrik M. Steinberg, Koln-Braunsfeld.

578,641. **Dress Shields.** Firma Leopold Pollenz, Vienna, Austria. Represented by F. Seemann and E. Vorwerk, both of Berlin.

CHEMICAL

United States

*18,884. **Carbon Black.** W. B. Wiegand, Sound Beach, Conn.

1,912,448. **Accelerator.** H. H. Harkins, River Edge, N. J., assignor to Naugatuck Chemical Co., Naugatuck, Conn.

1,912,671. **Rubber Composition.** H. M. Van Horn, Princeton, N. J., and M. Croce, Cheltenham, Pa., assignors, by mesne assignments, to Sloane-Blabon Corp., New York, N. Y.

1,912,812. **Accelerator.** T. Weigel, Cologne-Mulheim, assignor to I. G. Farbenindustrie A. G., Frankfurt a. M., both in Germany.

1,912,939. **Dyeing Rubber Dispersions.** E. A. Hauser, Frankfurt a. M., Germany, assignor to Revertex, Ltd., London, England.

1,913,113. **Improved Rubber Properties.** W. A. Gibbons, Montclair, N. J., assignor to Naugatuck Chemical Co., Naugatuck, Conn.

1,913,227. **Rubber Substitute.** M. Bandli, assignor of ½ to Leather Cloth Co., Ltd., both of London, England.

1,913,244. **Structural Rubber Composition.** F. Reimann, Berlin-Charlottenburg, Germany.

1,913,332. **Accelerator.** A. M. Clifford, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,913,621. **Age Resister.** I. Williams, Woodstown, N. J., and A. M. Neal, Wilmington, Del., assignors to E. I. du Pont de Nemours & Co., Wilmington, Del.

1,914,047. **Accelerator.** R. L. Sibley, Nitro, W. Va., assignor to Rubber Service Laboratories Co., Akron, O.

1,915,108. **Antioxidant.** W. P. ter Horst, Packanack Lake, N. J., assignor to Naugatuck Chemical Co., Naugatuck, Conn.

1,915,745. **Synthetic Rubber.** K. Meisenburg, Leverkusen, and W. Bock, Cologne-Mulheim, assignors to I. G. Farbenindustrie A. G. Frankfurt a. M., all in Germany.

1,915,808. **Rubber Bonding Agent.** D. F. Twiss and F. A. Jones, both of Birmingham, England, assignors to Dunlop Rubber Co., Ltd., a British corporation.

1,915,979. **Accelerator.** A. Cambron, Perth Amboy, N. J., assignor, by mesne assignments, to E. I. du Pont de Nemours & Co., a corporation of Del.

Dominion of Canada

330,893. **Rubber Coated Fabric.** Canadian Industries, Ltd., Montreal, P. Q., assignee of A. N. Parrett, Milwaukee, Wis., U. S. A.

330,894. **Rubber Coated Fabric.** Canadian Industries, Ltd., Montreal, P. Q., assignee of J. R. Couture, Newburg, N. Y., U. S. A.

330,926. **Accelerator.** Goodyear Tire & Rubber Co., assignee of A. M. Clifford, both of Akron, O., U. S. A.

330,927. **Accelerator.** Goodyear Tire & Rubber Co., assignee of L. B. Sebrell and A. M. Clifford, co-inventors, all of Akron, O., U. S. A.

330,929. **Age Resister.** Goodyear Tire & Rubber Co., assignee of A. M. Clifford and W. M. Lauter, co-inventors, all of Akron, O., U. S. A.

330,930 and 330,931. **Age Resister.** Goodyear Tire & Rubber Co., assignee of A. M. Clifford, both of Akron, O., U. S. A.

330,964. **Accelerator.** Roessler & Hasslacher Chemical Co., New York, N. Y., U. S. A., assignee of G. S. Whitby, Montreal, P. Q.

331,032. **Golf Ball Composition.** W. C. Geer, Ithaca, N. Y., U. S. A.

331,483. **Rubber Dispersion.** Flintkote Corp., Boston, Mass., assignee of H. L. Levin, Rutherford, N. J., both in the U. S. A.

331,531. **Chewing Gum Base.** Sweets Laboratories, Inc., assignee of F. V. Canning, both of New York, N. Y., U. S. A.

United Kingdom

388,668. **Rubber Bituminous Composition.** R. Toyer, Bedfordshire.

388,692. **Latex.** Naugatuck Chemical Co., assignee of A. W. Holmberg and P. E. Rice, all of Naugatuck, Conn., U. S. A.

388,776. **Attaching Rubber to Metal.** B. F. Goodrich Co., New York, N. Y., assignee of O. A. Thompson, Columbus, O., both in the U. S. A.

388,923. **Treating Latex.** Soc. Italiana Pirelli and G. Venosta, both of Milan, Italy.

389,062. **Rubber Composition.** Electrical Research Products, Inc., New York, N. Y., and A. R. Kemp, Westwood, N. J., both in the U. S. A.

389,086. **Coloring Rubber.** E. I. du Pont de Nemours & Co., Wilmington, Del., U. S. A.

389,109. **Synthetic Rubber.** W. W. Triggs, London. (E. I. du Pont de Nemours & Co., Wilmington, Del., U. S. A.)

389,115. **Polymerized Compound.** Triplex Safety Glass Co., Ltd., London, and L. V. D. Scorah and J. Wilson, both of Birmingham.

389,139. **Accelerator.** Roessler & Hasslacher Chemical Co., Perth Amboy, N. J., U. S. A.

389,151. **Polymerized Compound.** Triplex Safety Glass Co., Ltd., London, and L. V. D. Scorah and J. Wilson, both of Birmingham.

389,238. **Rubber Composition.** H. D. Elkington, London. (Azo A. G., Biel, Switzerland.)

389,452. **Fibrous Composition.** Dewey & Almy Chemical Co., assignee of S. B. Nieley, both of North Cambridge, Mass., U. S. A.

389,480 and 389,485. **Rubber Compound.** Hanseatische Mühlenwerke A. G., Hamburg, Germany.

389,487. **Compound Sheet Material.** Dunlop Rubber Co., Ltd., London; Anode Rubber Co., Ltd., St. Peter's Port, Channel Islands; and W. G. Gorham, Birmingham.

389,637. **Age Resister.** Dunlop Rubber Co., Ltd., London, and D. F. Twiss and F. A. Jones, both of Birmingham.

389,873. **Rubber Composition.** Improved Textile Rollers, Ltd., Manchester, and H. McGhee, Rushcutters Bay, Australia.

390,045. **Vulcanizing.** Naugatuck Chemical Co., Naugatuck, Conn., assignee of H. L. Fisher, Leonia, N. J., both in the U. S. A.

390,097. **Chlorinating Rubber.** I. G. Farbenindustrie A. G., Frankfurt a. M., Germany.

Germany

578,329. **Leather-like Rubber Masses.** Dunlop Rubber Co., Ltd., London, England, and The Anode Rubber Co., Ltd., St. Peter's Port, Channel Isles. Represented by W. Karsten and C. Wiegand, both of Berlin.

578,386. **Rubber Conversion Products.** Imperial Chemical Industries, Ltd., London, England. Represented by A. Bohr and H. Fincke, both of Berlin.

578,472. **Objects from Latex.** Societa Italiana Pirelli, Milan, Italy. Represented by B. Kugelmann, Berlin.

578,672. **Antiagers.** I. G. Farbenindustrie A.G., Frankfurt a.M.

578,673. **Vulcanizing Process.** I. G. Farbenindustrie A.G., Frankfurt a.M.

578,965. **Improving Rubber Masses.** I. G. Farbenindustrie A.G., Frankfurt a.M.

579,377. **Crude Rubber Poor in Albumins, from Latex.** Metallgesellschaft A.G., Frankfurt a.M.

GENERAL

United States

*18,863. **Section Insulator.** R. H. McCafferty, Wilmington, Del., assignor to Westinghouse Electric & Mfg. Co., a corporation of Pa.

1,912,408. **Pump Impeller Mounting.** H. J. Schelhammer, Whitestone, assignor to American Hard Rubber Co., New York, both in N. Y.

1,912,417. **Boot.** G. L. Van Dinter and C. Ferrettie, assignors to Mishawaka Rubber & Woolen Mfg. Co., all of Mishawaka, Ind.

1,912,451. **Vibration Absorbing Mounting.** F. H. Hibbard, Mountain Lakes, N. J., assignor to Electrical Research Products, Inc., New York, N. Y.

1,912,465. **Circlet.** A. M. Radlauer, Providence, R. I.

1,912,498. **Vehicle Resilient Suspension.** A. G. Rayburn, Sausalito, Calif., assignor, by mesne assignments, to Automotive Engineering Corp., a corporation of Del.

1,912,548. **Submarine Cable.** W. S. Smith, Newton Poppleford, H. J. Garnett, Sevenoaks, and H. C. Channon, London, all in England.

*Reissue.

1,912,664. **Elastic Girdle.** E. B. Smith, Chicago, Ill.
1,912,728. **Furniture Support.** De F. Roe, assignor to Colson Co., both of Elyria, O.
1,912,960. **Balloon.** S. Aki and G. Koizumi, both of London, England.
1,912,970. **Garter.** G. B. Cattell, Portsmouth, O.
1,913,098. **Endless Track for Tractors.** H. W. Alden, Detroit, Mich.
1,913,101. **Traffic Sign.** E. S. Bellows, Portland, Ore.
1,913,198. **Universal Joint.** H. D. Geyer, assignor to Inland Mfg. Co., both of Dayton, O.
1,913,287. **Table Cover and Protector.** L. M. Plansoen, Garfield, N. J.
1,913,513. **Oscillating Pivot Joint.** E. F. Rossman and G. W. Elsey, assignors to Delco Products Corp., all of Dayton, O.
1,913,627. **Teething Nipple and Pacifier.** R. H. Epstein, Brooklyn, N. Y.
1,913,629. **Mat.** F. J. Fredrickson, Evanston, Ill.
1,913,664. **Truck Tire Valve.** M. Finger, Wilmington, Del.
1,913,677. **Gasket.** A. H. Kinzel, Akron, O.
1,913,740. **Mold Forming Apparatus.** G. Ambuehl, Evanston, Ill.
1,913,933. **Oscillating Joints.** F. J. Lamborn and F. J. Ruppel, assignors to Chrysler Corp., Detroit, Mich.
1,913,935. **Vibration Damper.** R. K. Lee, assignor to Chrysler Corp., both of Detroit, Mich.
1,913,936. **Motor Mounting.** R. K. Lee, Highland Park, assignor to Chrysler Corp., Detroit, both in Mich.
1,913,984. **Torsional Vibration Damper.** W. E. Hann, assignor to Chrysler Corp., both of Detroit, Mich.
1,914,001. **Book Mark.** M. Warshay, Brooklyn, N. Y.
1,914,005. **Cigarette Container.** W. O. Brown, Detroit, Mich.
1,914,035. **Cheese Marker.** F. Moeschlin, Winterthur, assignor to Firm Schweizerische Kaseunion (S. K.), Bern, both in Switzerland.
1,914,079. **Automobile Engine Support.** C. W. Coseboom, assignor of ½ to K. White, both of Los Angeles, Calif.
1,914,097. **Electrical Conduit.** C. A. Barker, Highland Park, N. J., assignor to E. I. du Pont de Nemours & Co., Wilmington, Del.
1,914,252. **Hair Band.** C. M. Gorman, Cedar Rapids, Iowa.
1,914,301. **Brassiere.** H. Schottenfels, West New York, N. J.
1,914,348. **Cushion Support.** I. P. Whitehouse, assignor to H. C. Lord, both of Erie, Pa.
1,914,368. **Hose Coupling.** H. W. Goodall, Aldan, Pa.
1,914,392. **Laminated Glass Apparatus.** A. G. Worrall, assignor to L. J. Kolb, both of Philadelphia, Pa., trading as Safetee Glass Co.
1,914,399. **Vehicle Flooring.** B. Bronson, Lakewood, assignor to Ohio Rubber Co., Cleveland, both in O.
1,914,455. **Hose.** H. Pahl, Dusseldorf-Rath, Germany.
1,914,790. **Hose Patch.** F. J. Rupert, assignor of ½ to P. B. Wallace, both of Salem, Ore.
1,914,791. **Perfume Dispenser.** J. B. Schmitt and P. B. Brown, assignors to De Vilbiss Co., all of Toledo, O.
1,914,794. **Self-Supporting Hose.** G. Abraham, New York, N. Y.
1,914,830. **Hose Jumper.** S. M. Kostohris, Cleveland, O.
1,914,851. **Hose Shut-Off and Clamp.** J. Fyfe, Vancouver, B. C., Canada.
1,915,035. **Toy Gun.** H. W. Slice, assignor of ½ to G. Colella, both of Washington, D. C.
1,915,278. **Weather Strip.** D. H. Harnly, Chicago, Ill.
1,915,292. **Electric Treadle.** R. D. Conklin, Rahway, N. J., assignor to National Pneumatic Co., New York, N. Y.
1,915,303 and 1,915,304. **Pneumatic Vehicle Support.** A. E. Forsyth, assignor to Forsyth Automotive Pneumatic Spring, Ltd., both of Ottawa, Ont., Canada.
1,915,339. **Artificial Leather.** A. C. Sewall, Stoneham, Mass., assignor to Paper Patents Co., Neenah, Wis.
1,915,399. **Flexible Coupling.** J. Bibby, London, England, assignor to Falk Corp., Milwaukee, Wis.
1,915,574. **Shoe Tree.** H. Hallam, Leicester, England, assignor to United Shoe Machinery Corp., Paterson, N. J.
1,915,627. **Arch Protector.** J. E. Stagl, Brooklyn, N. Y.
1,915,775. **Windshield Wiper.** V. H. Christen, Detroit, Mich., assignor to C. E. Christen, Toledo, O.
1,915,794. **Pessary.** W. Leonhardt, Wismar in Mecklenburg, Germany.
1,915,899. **Tire Pressure Regulator.** A Monro and R. T. Wawn, both of Sydney, and M. Anderson, Randwick, all in N. S. W., Australia.
1,916,056. **Seat.** H. A. Lamplugh, Leamington, England.
1,916,133. **Undergarment.** S. L. Berger, Newton Center, Mass., and L. Levenson, Flushing, N. Y.
1,916,186. **Inkwell and Fountain Pen Set.** C. J. Meunier, New Orleans, La.

Dominion of Canada

330,839. **Bath Sponge.** W. Cox, Windsor, Ont.
330,925. **Boat.** General Tire & Rubber Co., assignee of A. G. Maranville, both of Akron, O., U. S. A.
331,021. **Cup.** G. Cubbon, Brandon, Man.
331,182. **Sole.** I. Banbury, Toronto, co-inventor, and M. C. Emerson, Windsor, assignee of W. K. Colbeck, Welland, co-inventor, all in Ont.
331,213. **Railway Car Buffing and Draw Gear.** R. T. Glascodine, London, England.
331,224. **Brush.** P. Mednick, Brooklyn, N. Y., U. S. A.
331,235. **Suction Cup.** O. C. Ritz-Woller, Chicago, Ill., U. S. A.
331,380. **Acoustical Wall.** B. E. Clark, Detroit, Mich., U. S. A.
331,389. **Tire Inner Lining.** S. R. Fetner, Jacksonville, Fla., U. S. A.
331,547. **Hernia Belt.** F. Hyde, assignee of W. Hyde, both of Toronto, Ont.

United Kingdom

387,772. **Railway Vehicle Undercarriage.** G. Spencer Moulton & Co., Ltd., and R. T. Glascodine, both of Westminster.
387,800. **Driving Belt.** O. L. Whittle, Lancashire.
387,882. **Gill-Bar Cleaner.** Textile Accessories and E. Fievet, both of Nord, France.
388,168. **Vehicle with Removable Body.** J. Dyson and R. A. Dyson & Co., Ltd., both of Liverpool, and A. Marenbon, London.
388,247. **Filter.** H. T. Durant, Sussex, and E. O. Stubbings, Surrey.
388,325. **Reciprocating Pump.** Knorr-Bremse A. G., Berlin, Germany.
388,330. **Bathing Cap.** Avon India Rubber Co., Ltd., Wiltshire, and T. W. Casey, Fairlawn, O., U. S. A.
388,359. **Tire.** Michelin & Cie., Puy-de-Dome, France.
388,388. **Stay for Windscreen.** A. B. Beitman, Cleveland Heights, O., U. S. A.
388,469. **Cow Milker.** G. S. Gordon, Auckland, New Zealand.
388,476. **Pneumatic Tire.** D. B. Miller, Ryde, Isle of Wight.
388,527. **Roller.** General Electric Co., Ltd., and C. R. Duncombe, both of London.
388,556. **Coated Fabric.** Johnson & Johnson (Gt. Britain), Ltd., Slough. (Johnson & Johnson, New Brunswick, N. J., U. S. A.)
388,677. **Rubber-Set Brush.** Hamilton & Co. (London), Ltd., London, and A. H. Timmis, Middlesex.
388,791. **Showcard Suction Cup.** G. Briggs, London.
388,839. **Feeding Bottle with Nipple.** D. J. McOmish, Hampton, Australia.
388,896. **Penholder.** G. Windisch, Steiermark, Austria.
388,953. **Handbag.** J. R. Thomas, London.
389,065. **Torsional-Oscillation Damper.** Reichsverband Der Automobilindustrie E. V., Berlin, Germany.
389,075. **Diaphragm Air Pump.** Soc. Anon. Francaise De L'Electropress, Paris, France.
389,241. **Massage Apparatus.** H. Bull, London.
389,243. **Golf Practice Ball.** T. H. Hart, Birmingham.
389,264. **Adhesive Bandage.** Johnson & Johnson (Gt. Britain), Ltd., Slough. (Johnson & Johnson, New Brunswick, N. J., U. S. A.)
389,267. **Elastic Stocking.** F. C. Jones, London.
389,328. **Windscreen Cleaner.** F. Olivero, Turin, Italy.
389,365. **Golf Club Grip.** A. H. Stevens, London. (L. A. Young Co., Detroit, Mich., U. S. A.)
389,490. **Driving Belt.** A. L. Freedlander, Dayton, O., U. S. A.
389,566. **Driving Belt.** Nuway Mfg. Co., Ltd., and J. H. Wray, both of Shropshire.
389,730. **Refrigerator.** Briggs Mfg. Co., assignee of W. Marshall, both of Detroit, Mich., U. S. A.
389,859. **Cable.** Telefonaktiebolaget L. M. Ericsson, Stockholm, Sweden.
390,014. **Bathing Cap.** I. K. De Wet, Witmoss, South Africa.
390,464. **Inflating Valve.** W. Milne, Dumbarton.

Germany

579,877. **Tire Cover.** India Rubber Gutta Percha & Telegraph Works Co., Ltd., London, England. Represented by F. Meffert and L. Sell, both of Berlin.

TRADE MARKS

United States

303,356. **Murogomme.** Wall covering. Hood Rubber Co., Inc., Watertown, Mass.

303,379. **Lynx.** Prophylactic articles. J. Schmid, New York, N. Y.

303,467. **Thorofare.** Tires and tubes. Dayton Rubber Mfg. Co., Dayton, O.

303,483. **Truk-Kushun.** Rubberized fabrics. Reading Rubber Mfg. Co., Reading, Mass.

303,528. **Shuflex.** Middle sole material for shoes. Endicott Johnson Corp., Endicott, N. Y.

303,617. Representation of a flower and thereupon the words: **"Camille Inc., Run-R-Stop for Hosiery."** Semi-liquid material for mending rubber, etc. Camille, Inc., Chicago, Ill.

303,647. **Naturalamb.** Prophylactic articles. Youngs Rubber Corp., Inc., New York, N. Y.

303,653. **Latex Bonded.** Brake lining. United States Rubber Co., New York, N. Y.

303,675. **Bloc-tex.** Brake lining. Union Asbestos & Rubber Co., Chicago, Ill.

303,691. **Non - destructible Brand.** Flooring and tiling. Holstein Rubber Products Co., Inc., Hartford, Conn.

303,725. Label containing representation of the Michelin man, and the words: **"The Michelin Tire Drinks Obstacles."** Pneumatic tires. Michelin Tire Co., Milltown, N. J.

303,801. Representation of a golf ball containing 3 stars. Golf balls. United States Rubber Co., New York, N. Y.

303,829. **"Dual-Stretch."** Corsets. Corsetry, Inc., assignor to The Corsetry, Inc., both of South Norwalk, Conn.

303,868. Representation of a tool and the words: **"Hot Patches,"** from which heat waves are emanating. Repair patch equipment. Shaler Co., Waupun, Wis.

303,885. **Rollon.** Tires and tubes. Dayton Rubber Mfg. Co., Dayton, O.

303,898. **The Magic Flote.** Pneumatic toys. Magic Flote Novelty Corp., Chicago, Ill.

303,908. **Midget.** Electric connecting plugs. Castle Rubber Co., East Butler, Pa.

303,926. Representation of a safe and a key and the words: **"Safe Key."** Prophylactic articles. A. Stuzin, Brooklyn, N. Y.

303,934. **Rick-Rack.** Toy novelty. Rick-Rack Co., Columbus, Ga.

303,988. Representation of a map of the United States and thereupon the words: **"Allstate."** Golf balls, etc. Sears, Roebuck & Co., Chicago, Ill.

304,001. **Lady Betty.** Sanitary goods. Marcus & Wiesen, Inc., New York, N. Y.

304,073. **Crusader.** Heels. Essex Rubber Co., Trenton, N. J.

304,094. Representation of the bottom of a shoe containing the word: **"So-Lo."** Adhesive preparation for shoe resoling and repairing compound. Perfect Mfg. Co., doing business as So-Lo Works, Cincinnati, O.

304,119. **Bagwin.** Rubberized fabric bags, etc. W. L. Gwynne, doing business as Bagwin Co., New York, N. Y.

304,147. **Cementone.** Expansion joint strips. A. C. Fischer, doing business as Servicised Sales Co., Chicago, Ill.

304,210. **Jiffy.** Jar rings. Hamilton Rubber Mfg. Co., Trenton, N. J.

304,213. **Silver-Tex.** Prophylactic articles. Killian Mfg. Co., Akron, O.

304,291. Square containing a circle, and a streamer containing the word: **"Rivals."** Prophylactic articles. Youngs Rubber Corp., Inc., New York, N. Y.

304,294. **Leedall.** Golf balls. Davega-City Radio Stores, Inc., New York, N. Y.

304,315. Design simulating a retort. Latex composition. Naugatuck Chemical Co., New York, N. Y.

304,318. Design simulating a retort enclosed in a hexagon. Latex composition. Naugatuck Chemical Co., New York, N. Y.

"MacHempIte" Rolls

RUBBER mill rolls made of the new, high-grade, air-hardening alloy steel "MacHempIte" are distinguished by greater strength, higher cooling capacity, and increased economy. Rolls of this revolutionary material have repeatedly set new standards of performance because they have exceptional stress and impact resistance and will not break. This feature is of vital importance in view of the fact that most rubber companies now are working stiffer and tougher rubber stocks than formerly.

The limitations of chilled iron rolls do not apply to this new alloy steel. Stiff stocks can be worked in such rolls to the full capacity of the mill with no danger of breakage. Not only is the thermal conductivity greater than that of chilled iron, but the walls of the rolls are thinner. Heat transfer is extremely rapid, making possible more efficient warming and cooling with corresponding increase in the capacity of the mill. Mackintosh-Hemphill Co., Pittsburgh, Pa.

OBITUARY

William J. Harpham

WILLIAM J. HARPHAM, 22, Yale graduate and son of Fred M. Harpham, vice president of Goodyear Tire & Rubber Co. and Goodyear Zeppelin Corp., both of Akron, O., died July 11 at Hartford Hospital, Hartford, Conn., after an operation for appendicitis.

Veteran Rubber Man

P. F. BOND, secretary-treasurer of the Kansas City Rubber & Belting Co., Kansas City, Mo., died at his home there on July 9. He had devoted many years to the rubber business, starting with the Diamond Rubber Co. when it was incorporated. After several years he joined the New York Belting & Packing Co., St. Louis, Mo., branch. In 1906 Mr. Bond became one of the incorporators of the Kansas City company and remained with the concern until his death.

He is survived by his widow, his father, and a brother.

United Carbon Official

ON JUNE 14, following a long illness, Caldwell Riggs, assistant treasurer and a director of United Carbon Co., Charleston, W. Va., died at a local hospital. He had been connected with the company in those capacities since 1925, when the company was started.

Mr. Riggs was born at Alma, W. Va., May 6, 1883. He went to the public schools and Marshall College. After graduating, he entered the banking business; which career was interrupted by his service in the United States army during the World War. Following his honorable discharge, he resumed his banking activities until 1923, when he became associated with Oscar Nelson in the manufacture of carbon black. Mr. Nelson, now president, was one of the founders of the United Carbon Co.

The deceased was a Shriner and a Scottish Rite Mason. This organization was in charge of the funeral services on June 16.

Surviving Mr. Riggs are his parents, his widow, 4 brothers, and a sister.

FINANCIAL

Continental Shares, Inc. The auction held July 13 involved the sale of collateral pledged to a syndicate of 13 banks by Continental Shares, Inc., the huge investment company founded by Cyrus S. Eaton. It was held in Cleveland's Lakeside Ave. courthouse, and Benjamin F. Fiery, attorney for the Cleveland Trust Co., conducted the sale.

The Cleveland Trust Co., as trustee for the 13 banks, bought in 190,000 shares of Goodyear common and a short time later, the Union Trust Co. tossed out 3,000 shares of Goodyear and 5,000 shares of Goodrich common.

The Cleveland auction will reduce Continental holdings in local rubber companies to 13,000 shares of Goodyear; 37,000 shares of Goodrich; and 33,000 shares of Firestone Tire & Rubber Co. Before the Chase auction Continental held 310,484 shares of Goodyear, being the largest single stockholder; 107,400 shares of Goodrich; and 131,300 shares of Firestone.

Servus Rubber Co., Rock Island, Ill., for 1932 reported a net loss of $119,211, compared with $11,824 loss the year before.

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Collyer Insulated Wire Co.	Com.	$0.10	July 1	June 26
Dominion Rubber Co., Ltd.	Pfd.	$1.75 q.	June 30	June 20
Faultless Rubber Co.	Com.	$0.50 q.	July 1	June 15
Firestone Tire & Rubber Co.	Com.	$0.10 q.	July 20	July 5
Norwalk Tire & Rubber Co.	7% Pfd.	$0.87½ q.	Oct. 1	Sept. 22

Market Reviews

CRUDE RUBBER

AT THE beginning of the month, the largest day's trading in the history of the Rubber Exchange was 11,760 tons. In the second week the record rose from 12,370 tons to 15,610 tons, then to 22,110 tons, and finally to 22,830 long tons as the all-time record. These figures give an idea of the violent speculative activity that characterized all commodity markets during the month. It shows also how vulnerable the market was to the slightest hint from Washington that prices had over-expanded. Gains of 368 to 424 points were reduced in the July 22 week to gains of 103 to 104 points for the first 4 weeks of July.

Several factors were responsible for the advance of almost 4¢ before a reaction set in: first, the decline in the dollar abroad; second, the record June consumption figures of 51,326 tons; third, the growing conviction that an agreement on restriction is not far off between the British and the Dutch Governments. The restriction negotiations were the most dominant factor although nothing definite has yet been announced.

Rubber statistics on the whole were favorable, with the large rate of consumption and the small imports most important. Malay shipments for June do not change much from their usual rate at this time of year. Stocks on hand, still large, declined below both those of a month and a year ago owing to the large consumption rate. Stocks afloat at 63,608 tons on June 30 are large, but if the consumption rate continues, they will be absorbed.

Automobile and tire figures made a good showing. June output of cars and trucks was 104% above last year, with the July rate holding up well. Sales are good too, according to dealers who say that no let-down has yet been discerned in takings. The May tire figures were equal to expectations, but it is the June figures that should be most interesting.

The rise in tire prices expected to be effected is in line with increased production and raw material costs.

RUBBER BULL POINTS

1. **Consumption of crude rubber for June was 51,326 tons in the United States, against 44,580 tons in May and 41,475 in June, 1932.**
2. **Imports of crude rubber in June were 22,729 long tons, a decrease of 17.5% under May and 45.1% under June, 1932.**
3. **The British and Dutch Governments appear to be close to an accord on restriction.**
4. **Tire prices are expected to advance by 10% or more owing to increased costs of raw material and production.**
5. **June output of automobiles at 195,178 units was 104% above June, 1932. For the first 6 months output was 17.6% above the same 1932 period. July output is estimated at 230,000 units.**
6. **Both estate and dealers' stocks on May 31 were below those of a year ago.**
7. **Stocks of crude rubber on hand June 30 were 333,954 tons, against 364,623 on May 31 and 345,702 on June 30 a year ago.**
8. **Shipments of pneumatic casings in May were 41.8% over April and 21.7% above May, 1932. Production was 66.1% and 35.8%, respectively, over the same periods.**
9. **Casings on hand were 27.9% below those of May 31, 1932.**

RUBBER BEAR POINTS

1. **June Malay shipments were 41,411 tons, against 42,902 in May and 36,566 in June, 1932.**
2. **Estate production was 37,793 tons in May, against 32,098 in April and 33,994 in May, 1932.**
3. **Stocks afloat on June 30 were 63,608 tons, compared with 43,342 on May 31, and 43,079 on June 30, 1932.**

Outside Market fluctuations were not so violent, but prices lost most of their early month gains. As prices advanced, buyers came into the market and again on the decline in the July 17 week. The decline in stocks on hand revealed that many manufacturers bought goodly proportions of rubber. The large tire and automobile output was also an aid to traders; and if the rate continues, the rubber purchased should work its way back to a normal rate.

Week ended July 1. A sharp uplift in cotton and wheat prices and a new high for sterling carried rubber futures above 7¢ on Monday. Profit taking was inevitable, but the market resisted well with heavy purchases reported. Transactions were between 5,000 and 6,000 tons daily up to Friday. Higher Dutch shipments supported the optimism concerning restriction, and the continued rise in automobile output was helpful. Quotations showed gains every day except Wednesday, to close 43 to 53 points higher for the week.

July closed at 6.45¢, compared with 6.00¢ the week before; September 6.75 against 6.28; October 6.85 against 6.37; December 7.06 against 6.56; January 7.15 against 6.64; March 7.33 against 6.80; and May 7.49 against 6.98.

Dutch East Indies shipments during May totaled 27,713 tons, against 19,436 in April and 19,422 in May, 1932, with increases by both natives and Europeans.

A cable from Amsterdam reflects the general attitude concerning restriction as follows: "The Dutch committee for restriction of rubber production, consisting of Mynheern Boldershey, Vanleewen, Boomkamp, Kasteleyn, and Enphoven, seriously discussed today the situation in general and the possibilities of consulting the Dutch Government concerning the execution of the plans. It is generally thought in Amsterdam that there is a reasonable possibility that the realization of restriction of rubber production may be consummated."

Official figures from the Commerce Department showed production of 218,171 automobiles in May, 37,504 more than April, and largest production for any month since July, 1931. Five-month production for 1933 was 753,656 units, against 688,342 for the same period last year and 1,322,295 for the first 5 months of 1931. June production is expected to be 250,000 units, a gain of 9% over May and 32% over June, 1932.

As usual on a rising market, business was good on the Outside Market. Wall Street and commission houses as well as factories bought heavily, one sale of 200 tons being reported. Prices gained over last week by a little more than ¼¢.

Nearbys sold at 6½ against 6⅛¢ the

New York Outside Market—Spot Closing Rubber Prices—Cents per Pound

	June, 1933					July, 1933					
	26	27	28	29	30	1	3	4*	5	6	7
Ribbed Smoked Sheet	6¼	6⅜	6⅜	6 7/16	6⅜	6½	6½	...	6¾	7¼	7½
No. 1 Thin Latex Crepe	7⅛	7¼	7¼	7 5/16	7¼	7⅜	7⅜	...	7⅝	8⅛	8¼
No. 1 Thick Latex Crepe	7	7⅛	7⅛	7 3/16	7⅛	7¼	7¼	...	7½	8	8⅛
No. 1 Brown Crepe ...	5¼	5⅜	5⅜	5 7/16	5⅜	5½	5½	...	5¾	6¼	6⅜
No. 2 Brown Crepe ...	5⅛	5¼	5¼	5 5/16	5¼	5⅜	5⅜	...	5⅝	6⅛	6¼
No. 2 Amber	5¼	5⅜	5⅜	5 7/16	5⅜	5½	5½	...	5¾	6¼	6⅜
No. 3 Amber	5⅛	5¼	5¼	5 5/16	5¼	5⅜	5⅜	...	5⅝	6⅛	6¼
No. 4 Amber	5	5⅛	5⅛	5 3/16	5⅛	5¼	5¼	...	5½	6	6⅛
Rolled Brown	4¾	4⅞	4⅞	4 15/16	4⅞	5	5	...	5¼	5¾	5⅞

	July, 1933												
	8	10	11	12	13	14	15	17	18	19	20	21	22
Ribbed Smoked Sheet	7⅜	7¼	7 5/16	7⅞	8⅜	8½	9	9¾	9⅜	8⅞	8⅛	7¾	7½
No. 1 Thin Latex Crepe	8⅛	8	8 1/16	8½	9	9⅛	9⅝	10½	10⅛	9⅝	8⅞	8½	8¼
No. 1 Thick Latex Crepe	8	7⅞	7 15/16	8⅜	8⅞	9	9½	10¼	10	9½	8¾	8⅜	8⅛
No. 1 Brown Crepe ...	6¼	6⅛	6 5/16	6⅝	6⅞	7	7¼	8¼	7⅞	7⅜	6¾	6½	6¼
No. 2 Brown Crepe ...	6⅛	6	6 1/16	6½	6¾	6⅞	7⅛	8⅛	7¾	7¼	6⅝	6⅜	6⅛
No. 2 Amber	6¼	6⅛	6 3/16	6⅝	6⅞	7	7¼	8¼	7⅞	7⅜	6¾	6½	6¼
No. 3 Amber	6⅛	6	6 1/16	6½	6¾	6⅞	7⅛	8⅛	7¾	7¼	6⅝	6⅜	6⅛
No. 4 Amber	6	5⅞	5 15/16	6¼	6½	6⅝	6⅞	7⅞	7½	7	6⅜	6⅛	5⅞
Rolled Brown	5¾	5⅝	5 11/16	6	6¼	6⅜	6⅝	7⅝	7¼	6¾	6⅛	5⅞	5⅝

*Holiday.

week before; August-September 6 11/16 against 6 5/16; October-December 6 15/16 against 6 9/16; and January-March 7 3/16 against 6 13/16.

Week ended July 8. The Rubber Exchange was closed Monday in addition to the July 4 holiday to enable members to transfer to their new quarters in the consolidated Commodity Exchange, Inc., 81 Broad St., New York, N. Y. In a short ceremony Richard Whitney, president of the Stock Exchange, and Jerome Lewine, president of the Commodity Exchange, spoke briefly, and a message from Governor Lehman was read.

The first day's trading in the new place was 6,740 tons, and the next day, at 11,760 long tons, it reached the highest level in rubber trading history in this country. Friday even this record was surpassed when 12,350 long tons were traded. Quite an auspicious start!

Prices gained from 83 to 99 points in this active market. July closed at 7.33¢ against 6.45¢ the week before; September 7.58 against 6.75; October 7.71 against 6.85; December 7.93 against 7.06; January 8.02 against 7.15; March 8.20 against 7.33; and May was 8.48 against 7.49.

Cables concerning restriction gave the market its biggest boost. Favorable action was predicted from London and Amsterdam, with the Central News quoting authoritative quarters that progress was good and that preliminary contacts between the Dutch and the British Governments were satisfactory.

The drop in the dollar value in terms of foreign exchange also encouraged buying; while a reported lack of c. i. f. offerings to supply factory buyers forced dealers into the market and resulted in some of the most frenzied trading seen in a long while.

Malay shipments during June were 41,411 tons, compared with 42,902 during May, 36,752 in April, and 36,566 in June, 1932. Since prices advanced during June, larger shipments were expected, but it is now feared that they may materialize during July.

Business in the Outside Market was decidedly better, with factories of all sorts buying in on the advance. Prices were quoted 1¢ higher on all positions. Nearbys sold at 7½¢ compared with 6½¢ the week before; August-September 7 11/16 against 6 11/16; October-December 7 15/16 against 6 15/16; and January-March 8 3/16 against 7 3/16.

Week ended July 15. Transactions that the newspapers called "sensational" featured the rubber market last week. Last week's record of over 12,000 tons for a single day's trading was eclipsed on Thursday by sales of 15,610 tons, followed by 13,130 on Friday, and then the largest half-day's trading on record for Saturday of 10,880 tons, with quotations jumping 110 to 137 points in 2 hours of trading. The 2 prime movers back of the rise were the "sensational" consumption figures for June and greater certainty that governmental restriction was in sight. Lesser factors were a rumored rise in tire prices and a sharp jump in automobile output for June compared with last year.

For the week prices gained from 2.42¢ to 2.72¢. September closed at 10.30¢, compared with 7.58¢ the week before; December 10.58 against 7.93; January 10.80 against 8.02; March 10.80 against 8.20; May 10.90 against 8.48.

June consumption of rubber by manufacturers of the United States set an all-time record of 51,326 long tons. It compared with 44,580 long tons for May, 1933, an increase of 15.1%, and with 41,475 long tons for June, 1932, an increase of 23.8%. For the first 6 months consumption was 184,724 tons, against 190,924 for the same 1932 period.

Imports were 22,729 long tons in June, 17.5% under May and 45.1% under June, 1932. Stocks afloat totaled 63,608 tons, compared with 43,342 on May 31 and 43,079 on June 30, 1932. Stocks on hand were 333,954 tons, against 364,623 on May 31.

Stocks afloat are large, "but not too large to satisfy present demands," as one trader put it.

The drop in stocks on hand seems to indicate that manufacturers are building up inventories to protect themselves against a depreciated dollar in the Far East, which would make rubber more expensive to United States buyers.

The National Automobile Chamber of Commerce figures show that June production by their members was 195,178 cars and trucks, an increase of 104% over the output for June, 1932, and an increase of 13.2% over May this year. The first 6 months' figures are 17.6% over the same 1932 period.

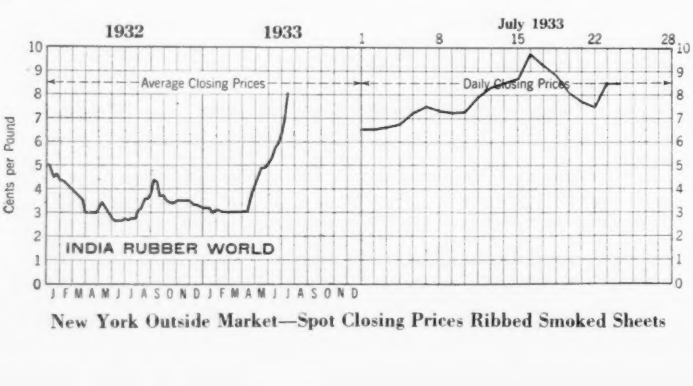
Because of the Textile Code and the rise in cotton and rubber prices, an increase of at least 10% is expected shortly in tire prices.

The rise in the Outside Market was less rapid than on the Exchange, but it averaged almost 1½¢. Most of it resulted from the belief that a restriction plan is not far off; and with manufacturers building up inventories against higher prices, business was very good outside.

Nearby ribbed smoked sheets were quoted at 9¢, compared with 7½¢ the week before; August-September 9¼ against 7 11/16; October-December 9½ against 7 15/16; January-March 9¾ against 8 3/16; and April-June 10 against 8 7/16.

Week ended July 22. Touched off by the decline in wheat and stocks, rubber prices were hit hard by an avalanche of selling orders that wiped out most of the sensational gains

(*Continued on page 64*)



New York Outside Market—Spot Closing Prices Ribbed Smoked Sheets

New York Quotations

New York outside market rubber quotations in cents per pound

	July 25, 1932	June 26, 1933	July 25, 1933
Plantations			
Rubber latex.... *gal.*	51	42	72
Sheet			
Ribbed, smoked, spot	2 15/16/3	6 /6⅛	8⅜/8⅝
Aug.-Sept.	3	6 3/16/6¼	8½/8¾
Oct.-Dec.	3 1/16/3⅛	6 7/16/6⅝	8¾/9
Jan.-Mar.	3 3/16/3¼	6 11/16/6¾	9
Crepe			
No. 1 thin latex, spot	3¾/3 13/16	6¾/6⅞	9 /9⅜
Aug.-Sept.	3¾/3⅞	6 15/16/7	9¼/9½
Oct.-Dec.	3⅞/3 15/16	7 3/16/7¼	9½/9¾
Jan.-Mar.	4 /4 1/16	7 7/16/7½	9¾/10
No. 3 Amber, spot.	2¾/2 13/16	4 15/16/5	7 /7¼
No. 1 Brown	2¾/2 15/16	5 /5⅛	7¼/7½
Brown, rolled	2½/2⅝	4½/4 9/16	6¼/6½
Paras			
Upriver fine	6¼	8¾	10¾
Upriver fine	*10	*11½	*14¾
Upriver coarse	..	..	..
Upriver coarse	*4¾	*7¼	*10
Islands fine	..	8½	9
Islands fine	*9¾	*11½	*14½
Acre, Bolivian fine.	6¾	9	11
Acre, Bolivian fine.	*10½	*11¾	*15
Beni, Bolivian ...	6¾	9¼	11¼
Madeira fine	6½	9	11
Pontianak			
Bandjermasin	5	6	9½/10
Pressed block	7	10	14 /14½
Sarawak	5	6	9½/10
Caucho			
Upper ball	..	..	..
Upper ball	*4¾	*7	*10
Lower ball	..	..	..
Manicobas			
Manicoba, 30% guar.	†2	†5	†6
Mangabiera, thin sheet	†2	..	..
Guayule			
Duro, washed and dried	12	12	12
Ampar	12	13	13
Africans			
Rio Nuñez	8½	10	11
Black Kassai	8¼	9¾	10½
Manihot cuttings ..	6	4¼	5¼
Prime Niger flake..	12	16⅛	17½
Gutta Percha			
Gutta Siak	7	10½	14 / 15
Gutta Soh	15	13	16½/ 17
Red Macassar ...	1.50	1.75	1.60 /1.75
Balata			
Block, Ciudad Bolivar	16	27	27 /29
Manaos block	32	28	27 /29
Surinam sheets ...	32	35	42 /44
Amber	35	39	45 /50

*Washed and dried crepe. Shipments from Brazil. †Nominal.

RUBBER SCRAP — RECLAIMED RUBBER

QUOTATIONS on all grades of rubber scrap have taken a strong upward turn because of the suddenly enlarged production of reclaim. Dealers in scrap are very reluctant sellers, holding off to make a profit on stocks accumulated at old high costs. The activity of the market is stimulating to collectors over wider territory and will soon enlarge the available supply of scrap.

There is a very good demand for inner tubes, truck tires, and auto peelings for export.

BOOTS AND SHOES. These are scarce and collections are poor. Consumer demand is good. Prices have advanced approximately 33% on all grades of this type of scrap.

TIRES. The consumption of tire scrap grades is very heavy. Besides the demand for reclaiming, old tires are depended upon as a source for the manufacture of emergency tire repair patches. Truck tires also are very scarce. Some grades of pneumatic tire scrap advanced as much as 30 to 40%.

TUBES. Inner tubes are in exceptionally good demand, and the available supply is quite limited. The reclaim from tubes is being favored in the composition of the better quality of the light colored mats used in the front compartments of automobiles. Prices are up 50 to 75%.

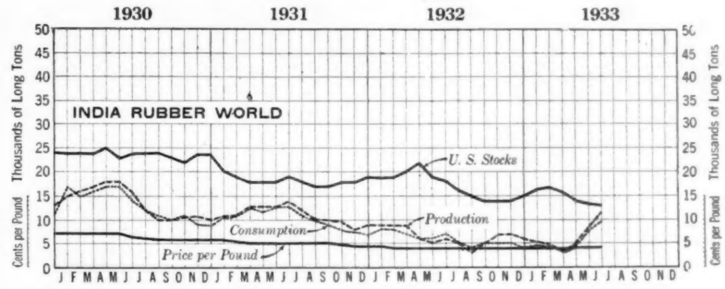
MECHANICALS. These grades are still dull because the trade is interested exclusively in the better grades of staple scrap. Prices, however, have risen about 25%.

HARD RUBBER. Hard rubber scrap shows no change in price.

CONSUMERS' BUYING PRICES

(Carload Lots Delivered Eastern Mills)
July 25, 1933

Boots and Shoes		Prices
Boots and shoes, black	lb.	\$0.01¼/\$0.01½
Colored	lb.	.01 / .01¼
Untrimmed arctics	lb.	.01 / .01¼
Inner Tubes		
No. 1, floating	lb.	.05¾/ .06
No. 2, compound	lb.	.03¼/ .03½
Red	lb.	.03 / .03¼
Mixed tubes	lb.	.03 / .03¼
Tires (Akron District)		
Pneumatic Standard		
Mixed auto tires with beads	ton	13.00 /14.50
Beadless	ton	17.50 /19.00
Auto tire carcass	ton	14.00 /16.00
Black auto peelings	ton	23.00 /25.00
Solid		
Clean mixed truck	ton	30.00 /33.00
Light gravity	ton	35.00 /37.00
Mechanicals		
Mixed black scrap	lb.	.01 / .01¼
Hose, air brake	ton	9.00 /10.00
Garden, rubber covered	ton	9.00 /10.00
Steam and water, soft	ton	9.00 /10.00
No. 1 red	lb.	.01¾/ .01⅞
No. 2 red	lb.	.01 / .01¼
White druggists' sundries	lb.	.01¾/ .01⅞
Mechanical	lb.	.01¼/ .01½
Hard Rubber		
No. 1 hard rubber	lb.	06⅜/ .06½



Production, Consumption, Stocks, and Price of Tire Reclaim

United States Reclaimed Rubber Statistics—Long Tons

Year	Production	Consumption	Consumption Per Cent to Crude	United States Stocks*	Exports
1930	157,967	153,497	41.5	24,008	9,468
1931	132,462	125,001	35.7	19,257	6,971
1932	75,656	77,500	23.3	21,714	3,536
1933					
January	5,301	4,811	21.0	16,262	130
February	4,578	4,363	20.2	16,570	178
March	3,847	3,454	19.1	15,496	353
April	4,617	4,407	16.8	14,370	165
May	8,366	7,770	17.4	13,734	319
June	10,591	9,674	18.8	13,231	...

* Stocks on hand the last of the month or year.
Compiled by The Rubber Manufacturers Association, Inc.

THE change for the better that became apparent 3 months ago developed with startling rapidity during the past month into a widespread demand for reclaim on the part of rubber goods manufacturers generally. The incentive is to rush the production of their goods to supply shortages of jobbers and dealers who are placing orders in anticipation of rising prices. Manufacturers also desire to extend as far as possible their own stocks of low-price crude by restoring reclaim in their formulas. Thus all rubber manufacturers are hastening production before commodity prices are advanced to double their record lows as has already occurred in the case of cotton.

Reclaimers are operating their plants 24 hours a day, 6 days a week in an effort to meet demands of the industry. The sharp rise in scrap tires and tubes has already been felt by reclaimers and is reflected in the price advance quoted on all grades of reclaim.

June reclaimed rubber consumption is estimated at 9,674 long tons; production 10,591 long tons; and stocks on hand June 30, 13,231 long tons. The ratio of reclaim consumption to that of crude advanced 1.4% to 18.8%.

The figures named below are in every instance nominal quotations only. Further advances are impending, depending on reclaim demand and scrap prices.

New York Quotations

July 25, 1933

	Spec. Grav.	Cents per Lb.
High Tensile		
Super-reclaim, black	1.20	7 /7½
red	1.20	6½/7
Auto Tire		
Black	1.21	5 /5½
Black selected tires	1.18	5¼/5¾
Dark gray	1.35	5½/6
White	1.40	6½/7
Shoe		
Unwashed	1.60	6½/7
Washed	1.50	8 /9
Tube		
No. 1	1.00	7½/8
No. 2	1.10	6½/7
Truck Tire		
Truck tire, heavy gravity	1.55	6 /6½
Truck tire, light gravity	1.40	6¼/6¾
Miscellaneous		
Mechanical blends	1.60	4 /4½

Deadness in Reclaim

IT IS possible to imitate and, perhaps, improve on the main virtue of reclaim, viz., deadness, by producing a more plastic and less elastic material. A more plastic rubber would require less mastication, more rapid extrusion, quicker calendering, and easier molding. There would be a large market for this rubber, particularly if the vulcanizing and aging properties were maintained. Considerable progress has been made in producing this type of rubber, but it has not been possible to produce a rubber which will give vulcanized products equal in quality to those produced by crepe or sheet. The alternative is to compromise between vulcanizing properties and ease of manipulation. There has been recently offered a "softened" rubber (Ungar and Schidrowitz, B.P., No. 368,902, 1932).


Dustless
THE MAGIC LAMP...YOUR PROTECTION FOR OVER FIFTY YEARS
MICRONEX
the original dense pellet black for rubber was introduced to the industry more than five years ago. Today, still maintaining the standards of its makers, DUSTLESS MICRONEX is successfully meeting the most difficult mill room conditions.
200 TONS OF SMOKE A DAY
BINNEY & SMITH CO.
ORIGINAL PATENTEES
41 EAST 42nd STREET. NEW YORK. N. Y.

COMPOUNDING INGREDIENTS

RUBBER goods production has reached a very active stage in all lines, resulting in heavy demand for compounding ingredients generally. The output of tires and tubes has been stepped up to capacity. Mechanical rubber goods plants are also operating the full week on 3, 8-hour shifts daily. Activity is increasing also in auto topping, clothing, footwear, and insulation.

Carbon black sales are heavy for July and August consumption. Higher prices have been talked of, but stocks in Louisiana and Texas are still quite large. The popular no-fabric style of competitive garden hose provided an important outlet for carbon black this season.

Price increases have been sustained in certain compounding materials due to increased demand and advance in basic supplies. For example, the third raise of ¼¢ a pound on litharge in the space of 40 days brought the price of this material in casks to 7¢ the middle of July.

Lithopone and zinc oxide for the second half-year consumption are contracted for at current levels. Titanium pigments are in good demand at firm prices.

Stearic acid advanced ¼¢ a pound. Rubber solvent, both heavy and light grades, advanced twice by ¼¢ a gallon f.o.b. at Group 3 refineries in tank car lots, bringing the quotation on July 10 to 5¾¢.

Gilsonite and mineral rubber prices are firm, and good orders are reported received from manufacturers of auto topping and other rubber products.

There is a strong demand for factice, or rubber substitute. Prices have a decidedly upward tendency due to the continued advance in vegetable oils.

The increase in rubber goods production has not been reflected in the demand for mineral colors such as green pigments. In this line, movement the past few months has continued unchanged. Owing to an overproduction condition prices are not showing greater firmness.

Accelerator and antioxidant needs of practically all manufacturers are covered by contracts; therefore no price increases have been made.

New York Quotations

July 25, 1933

Prices Not Reported Will Be Supplied on Application

Abrasives

Pumicestone, pwd.	*lb.*	$0.02½/$0.04
Rottenstone, domestic	*ton*	23.50 /28.00

Accelerators, Inorganic

Lime, hydrated	*ton*	20.00
Litharge (commercial)	*lb.*	.07
Magnesia, calcined, heavy	*lb.*	.04
carbonate	*lb.*	.06 / .06¼

Accelerators, Organic

Accelerator 49	*lb.*	.38 / .48
Aldehyde ammonia	*lb.*	.65 / .70
Altax	*lb.*	
Barak	*lb.*	
Butene	*lb.*	
Captax	*lb.*	
Crylene	*lb.*	
paste	*lb.*	
DBA	*lb.*	
Di-esterex N.	*lb.*	
DOTG	*lb.*	.42 / .52
DPG	*lb.*	.33 / .43
du Pont 808	*lb.*	
833	*lb.*	
Ethylidine aniline	*lb.*	
Formaldehyde aniline	*lb.*	.37½/ .40
Heptene	*lb.*	
base	*lb.*	
Hexamethylenetetramine	*lb.*	.37
Lead oleate, No. 999	*lb.*	.10
Witco	*lb.*	.11
Lithex	*lb.*	
Monex	*lb.*	
Novex	*lb.*	
Plastone	*lb.*	
R & H 40	*lb.*	
50-D	*lb.*	
Safex	*lb.*	
Super-sulphur No. 1	*lb.*	
No. 2	*lb.*	
Tetrone A	*lb.*	
Thiocarbanilid	*lb.*	.20
Thionex	*lb.*	
Trimene	*lb.*	
base	*lb.*	
Triphenyl guanidine	*lb.*	.58 / .60
Tuads	*lb.*	
Vulcanex	*lb.*	
Vulcanol	*lb.*	
Vulcone	*lb.*	
ZBX	*lb.*	
Zimate	*lb.*	

Acids

Acetic 28% (bbls.)	*100 lbs.*	2.90 / 3.15
glacial (carboys)	*100 lbs.*	10.52 /10.77
Sulphuric, 66°	*ton*	15.50

Age Resisters

Age-Rite Gel	*lb.*	
powder	*lb.*	
resin	*lb.*	
white	*lb.*	
Albasan	*lb.*	
Antox	*lb.*	
BLE	*lb.*	
Neozone	*lb.*	
Parazone	*lb.*	
Permalux	*lb.*	
VGB	*lb.*	
Zalba	*lb.*	

Antiscorch Material

UTB	*lb.*	

Antisun Materials

Heliozone	*lb.*	
Sunproof	*lb.*	

Binders, Fibrous

Cotton flock, dark	*lb.*	$0.09 /$0.11½
dyed	*lb.*	.50 / .80
white	*lb.*	.11½/ .15
Rayon flock, colored	*lb.*	1.60 / 1.75
white	*lb.*	1.40

Colors

BLACK		
Bone, powdered	*lb.*	.05½/ .15
Drop	*lb.*	.05½/ .17
Lampblack (commercial)	*lb.*	.10
BLUE		
Prussian	*lb.*	.35 / .37
Toners	*lb.*	.80 / 3.50
Ultramarine	*lb.*	.07 / .10
BROWN		
Mapico	*lb.*	
Sienna, Italian, raw, pwd.	*lb.*	.04½/ .11
GREEN		
Chrome, light	*lb.*	.23 / .25½
medium	*lb.*	.26 / .27½
oxide	*lb.*	.19 / .21
Guignet's(bbls.)f.o.b.Easton	*lb.*	.70
Toners	*lb.*	.85 / 3.50
ORANGE		
Toners	*lb.*	.40 / 1.60
ORCHID		
Toners	*lb.*	1.50 / 2.00
PINK		
Toners	*lb.*	1.50 / 4.00
PURPLE		
Toners	*lb.*	.60 / 2.00
RED		
Antimony		
Crimson, R. M. P. No. 3	*lb.*	.46
Sulphur free	*lb.*	.48
7-A	*lb.*	.33
Z-2	*lb.*	.20
Iron Oxides		
Rub-er-red (bbls.) f.o.b. Easton	*lb.*	.08¾
Mapico	*lb.*	
Toners	*lb.*	.80 / 2.00
WHITE		
Lithopone (bags)	*lb.*	.04¾
Albalith	*lb.*	.04½/ .04¾
Cryptone No. 19	*lb.*	.06 / .06¼
CB No. 21	*lb.*	.06 / .06¼
Titanium oxide, pure	*lb.*	.17 / .18¾
Titanox "B"	*lb.*	.06 / .06½
"C"	*lb.*	.06 / .06½
Zinc Oxide		
Black label (lead free)	*lb.*	.05¾
F. P. Florence, green seal	*lb.*	$0.09⅝/$0.09⅞
red seal	*lb.*	.08⅝/ .08⅞
white seal (bbls.)	*lb.*	.10⅞
Green label (lead free)	*lb.*	.05¾
seal, Anaconda	*lb.*	.09⅝/ .10⅛
Horsehead (lead free) brand		
Selected	*lb.*	.05¾/ .06
Special	*lb.*	.05¾/ .06
XX	*lb.*	.05¾/ .06
green	*lb.*	.05¾/ .06
red	*lb.*	.05¾/ .06
Kadox, black label	*lb.*	.09⅝/ .09⅞
blue label	*lb.*	.08⅝/ .08⅞
red label	*lb.*	.07¼/ .07½
Lehigh (leaded)	*lb.*	.0490/ .0515
Red label (lead free)	*lb.*	.05¾
seal, Anaconda	*lb.*	.08⅝/ .09⅛
Standard (leaded)	*lb.*	.05½/ .05¾
Sterling (leaded)	*lb.*	.05½/ .05¾
Superior (leaded)	*lb.*	.05½/ .05¾
U. S. P. (bbls.)	*lb.*	.12¾
White seal, Anaconda	*lb.*	.10⅞/ .11⅞
XX zinc sulphide (bbls.)	*lb.*	.13
YELLOW		
Chrome	*lb.*	.15
Mapico	*lb.*	
Ochre, domestic	*lb.*	.01⅜/ .02⅝
Toners	*lb.*	2.50

Factice—See Rubber Substitutes

Fillers, Inert

Asbestine	*ton*	14.00
Barytes (f.o.b. St. Louis)	*ton*	23.00
off color	*ton*	
white	*ton*	
Blanc fixe, dry, precip	*ton*	60.00 /65.00
pulp	*ton*	42.50 /45.00
Infusorial earth	*lb.*	.03
Kalite No. 1	*ton*	
No. 3	*ton*	
Suprex, heavy	*ton*	45.00 /55.00
white, extra light	*ton*	60.00 /80.00
Whiting		
Chalk, precipitated	*lb.*	
Domestic	*ton*	
Hakuenka	*lb.*	
Paris white, English cliffstone	*100 lbs.*	
Sussex	*ton*	
Witco	*ton*	20.00

Fillers for Pliability

Flex	*lb.*	
Fumonex	*lb.*	
P-33	*lb.*	
Thermax	*lb.*	
Velvetex	*lb.*	

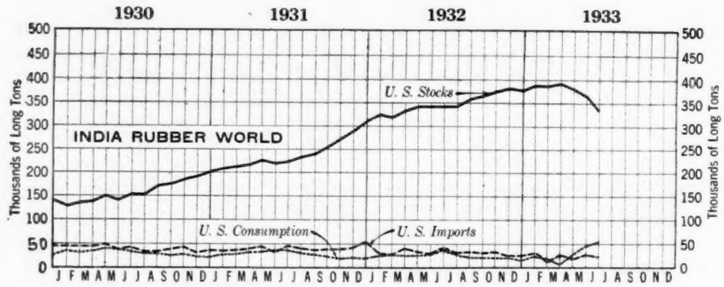
Finishes

IVCO lacquer	*gal.*	
Mica, amber	*lb.*	.05
Rubber lacquer No. 106	*gal.*	3.00
Starch, corn, pwd.	*100 lbs.*	2.84 / 2.95
potato	*lb.*	.05¼/ .06
Talc, dusting	*ton*	
Pyrax A	*ton*	

Latex Compounding Ingredients		
Accelerator 552	lb.	
Aquarex	lb.	
Catalpo	ton	
Colloidal color pastes	lb.	
sulphur	lb.	
zinc oxide	lb.	
Disinfectants	lb.	
Dispersaid	lb.	
Dispersed Antox	lb.	
Emulsified Heliozone	lb.	
Neozone L	lb.	
Tepidone	lb.	
Mineral Rubber		
Genasco (fact'y)	ton	$30.00 /$32.00
Gilsonite (fact'y)	ton	37.34 / 39.65
Granulated M. R.	ton	
Hydrocarbon, granulated	ton	40.00 / 42.00
hard	ton	
Parmr Grade 1	ton	
Grade 2	ton	
Mold Lubricants		
Sericite	ton	
Soapbark (cut)	lb.	.07 / .08
Soapstone	ton	
Oils		
Castor, blown	lb.	.12¼/ .12¾
Poppy seed	gal.	1.55 / 1.60
Red, distilled (bbls.)	lb.	.07 / .07⅝
Protective Colloid		
Casein, domestic	lb.	.13¼/ .13½
Reenforcers		
Carbon Black		
Aerfloted arrow black	lb.	.02¾
Arrow specification black	lb.	.03
Century (works, c. l.)	lb.	.0282
Certified, Cabot, c. l., f. o. b. works, bags	lb.	.0272
c. l., f. o. b. works, cases	lb.	.04¼
l. c. l., f. o. b. works	lb.	.04¾
Spheron (Dense Dustless Black) c. l., f. o. b. works	lb.	.0272
Disperso (works, c. l.)	lb.	.0282
Dixie brand	lb.	.0272/ .06½
Kosmos brand	lb.	.0272/ .06½
Micronex	lb.	
Ordinary (compressed or uncompressed)	lb.	
Clays		
Blue Ridge, dark	ton	
China	ton	
Dixie	ton	
Langford	ton	
Par	ton	
Perfection	ton	20.00
Standard	ton	
Suprex No. 1	ton	8.00
No. 2, dark	ton	6.50
Glue, high grade	lb.	.19 / .24
Reodorants		
Amora A	lb.	
B	lb.	
C	lb.	
D	lb.	
Para-Dors	lb.	1.00 / 6.50
Rodo	lb.	
Rubber Substitutes or Factice		
Amberex	lb.	.15
Black	lb.	.06 / .08
Brown	lb.	.06½/ .11
White	lb.	.07½/ .12
Softeners		
Burgundy pitch	lb.	.05
Hardwood pitch, c.l.	ton	24.00 /25.00
Palm oil (Witco)	lb.	.07
Petrolatum, light amber	lb.	.02⅜/ .02½
Pine tar	gal.	.25
Plastogen	lb.	
Rosin oil, compounded	gal.	.30
Rubtack	lb.	.10
Tonox	lb.	
Witco Flux	gal.	.20
Solvents		
Benzol (90% drums)	gal.	.27
Bondogen	gal.	
Carbon bisulphide (drums)	lb.	.05½/ .12
tetrachloride	lb.	.05¼/ .06
Turpentine, steam distilled	gal.	.51 / .52
Stabilizers for Cure		
Laurex, ton lots	lb.	
Stearex B	lb.	
flake	lb.	
Stearic acid, dbl. pres'd.	lb.	
Zinc stearate	lb.	
Vulcanizing Ingredients		
Sulphur		
Chloride, drums	lb.	.03½/ .04
Flowers, extrafine refined, U.S.P.	100 lbs.	
Rubber	100 lbs.	1.85 / 2.70
Telloy	lb.	
Vandex	lb.	

(See also Colors—Antimony)

IMPORTS, CONSUMPTION, AND STOCKS



United States Stocks, Imports, and Consumption

CONSUMPTION of crude rubber by manufacturers in the United States for June amounted to 51,326 long tons, the highest consumption figure on record. This compares with 44,580 long tons for May, 1933, and 41,475 tons for June, 1932, increases of 15.1% and 23.8% respectively, according to The Rubber Manufacturers Association, Inc. Consumption for the first half of 1933 totaled 184,724 long tons against 190,924 long tons for the first 6 months of 1932.

Crude rubber imports for June were 22,729 long tons, a decrease of 17.5% under May and 45.1% below June, 1932.

The estimated total domestic stocks of crude rubber on hand June 30 were 333,954 long tons, which compares with May 31 stocks of 364,623 long tons. June stocks decreased 8.4%, compared with May, 1933, and were slightly lower than those on June 30, 1932.

Crude rubber afloat for the United States ports was 63,608 long tons on June 30 against 43,342 long tons afloat on May 31, 1933, and 43,079 long tons afloat on June 30, 1932.

London and Liverpool Stocks

Week Ended	London (Tons)	Liverpool (Tons)
July 1	43,748	59,560
July 8	43,319	59,372
July 15	42,745	59,135
July 22	42,046	58,901

United States and World Statistics of Rubber Imports, Exports, Consumption, and Stocks

Twelve Months	U. S. Net Imports* Tons	U. S. Consumption Tons	U. S. Stocks on Hand† Tons	U. S. Stocks Afloat† Tons	United Kingdom Stocks†‡ Tons	Singapore and Penang, Etc., Stocks†‡ Tons	World Production (Net Exports)‡ Tons	World Consumption Estimated‡ Tons	World Stocks†‡§ Tons
1930	488,343	375,980	200,998	56,035	118,297	45,179	821,815	684,993	366,034
1931	495,163	348,986	322,825	40,455	127,103	55,458	797,441	668,660	495,724
1932	400,787	322,000	379,000	38,360	92,567	36,802	709,860	670,250	518,187
1933									
January	31,110	22,906	385,811	32,539	89,050	35,746	63,951	52,120	521,173
February	18,875	21,638	381,794	32,898	90,172	34,354	56,056	54,900	518,166
March	27,879	18,047	390,135	29,531	94,565	34,089	61,932	59,100	518,812
April	19,459	26,226	382,167	30,745	95,066	33,520	57,180	61,300	510,753
May	27,556	44,580	364,623	43,342	98,538	37,876	67,050	76,840	501,037
June	22,729	51,326	333,954	63,608	......	......	......	......	......

*Including liquid latex, but not guayule. †Stocks on hand the last of the month or year. ‡W. H. Rickinson & Son's figures. §Stocks at the 3 main centers, U. S. A., U. K., Singapore and Penang.

U. S. Crude and Waste Rubber Imports for 1933

	Plantations	Latex	Paras	Africans	Centrals	Guayule	Manicoba and Matto Grosso	Totals 1933	Totals 1932	Balata	Miscellaneous	Waste
Jan. ....tons	30,123	680	297	10	..	..	..	31,110	31,298	8	516	..
Feb.	18,407	246	217	5	..	..	..	18,875	30,546	16	483	1
Mar.	27,074	528	269	8	..	..	..	27,879	42,382	49	836	..
Apr.	18,436	654	369	..	..	..	..	19,459	37,017	14	463	10
May	26,770	629	147	10	..	..	..	27,556	32,224	47	628	..
June	22,086	451	192	..	..	..	..	22,729	41,394	463	574	..
Total, 6 mos., 1933 .....tons	142,896	3,188	1,491	33	..	..	..	147,608	.....	597	3,500	11
Total, 6 mos., 1932 .....tons	212,131	1,855	752	123	..	..	..	.....	214,861	340	3,655	105

Compiled from The Rubber Manufacturers Association, Inc., statistics.

COTTON AND FABRICS

THE cotton market was watching the Department of Agriculture as it started its drive to reduce 10,000,000 acres in the present crop. So for the first 3 weeks prices fluctuated with reports concerning the success of the plan. By the time the campaign closed, prices had risen 176 to 190 points in anticipation of its success. Growers had pledged themselves to destroy cotton growing on 9,000,000 acres, or over 3,000,000 bales. Later advices revealed that pledges were in for another million acres.

Meanwhile manufacturers met in Washington and adopted an industrial code revolutionary in its provisions. A minimum wage of $12 and $13 was set, with a 32-hour week, and child labor was abolished. Expectation that 100,000 men would be added to cotton mill payrolls at the higher salaries indicated that the purchasing power necessary to support an advance in raw material prices would be provided by this industry at least.

Manufacturers, anticipating the processing tax to be imposed on their finished goods to finance the payment of rentals and other forms of bounty to farmers reducing their acreage, were taking record quantities of cotton. The June consumption report showed the largest month's takings on record, with July operations at almost the same rate.

With 12¢ cotton almost an accomplished fact, rumors began to circulate that the rise in prices had been too rapid, that purchasing power had not kept pace and that speculators were running away with the market.

In the third week of July the corrective reaction set in, started by an alarming drop in wheat and over-sold alcohol stocks. All markets were affected, with the losses in cotton erasing all but about 60 points of the earlier gains.

The liquidation was expected and has served to bring values to a more reasonable level. From now on quotations should steady themselves, with the watchful eye of the administration at Washington guarding against violent speculative advances which do not reflect real values.

Week ended July 1. The beginning of the government's drive to reduce by 25% this year's cotton crop, depreciation of the dollar abroad, dollar wheat, formulation of a code for the cotton industry, and news from the London conference were the factors influencing the market the last week. On Monday cotton prices rose $4 a bale to cross the 11¢ level, the highest since April, 1931. Profit taking made the day's gains 83 to 85 points, which were subject to erratic trading, but at the close, quotations were from 61 to 68 points higher for the week.

July closed at 10.14¢, compared with 9.46¢ last week; October 10.40¢ against 9.74; December 10.55 against 9.89; January 10.62 against 9.98; March 10.75 against 10.14; and May 10.92 against 10.28.

COTTON BULL POINTS

1. **June cotton consumption was 696,472 bales, the largest for any month since records started September, 1912.**
2. **Cotton spinning activity in June was 129.1% of capacity, against 112.3% in May and 57.6% in June, 1932.**
3. **Cotton consumption from July 1 to 15 was above the record June rate.**
4. **More than 10,000,000 acres of this year's crop have been pledged for destruction, equivalent to about 3,000,000 bales.**
5. **A drought in Texas and Oklahoma has raised fears of a deteriorated crop there.**
6. **Forwardings to mills of the world are now almost 1,000,000 bales above last year and 3,000,000 above 1931.**
7. **Exports are within 300,000 bales of last year and 1,500,000 above 1931.**
8. **The Industrial Code adopted by the cotton industry is expected to add 100,000 men to payrolls.**
9. **An advance of $3,000,000 or $4,000,000 will be made to Russia to purchase our cotton.**
10. **Cotton on hand in consuming establishments and public storage on June 30 was 7,719,748 bales, against 8,471,640 last year.**

COTTON BEAR POINTS

1. **The carryover stock of cotton on July 1 at 9,329,000 bales was over 1,000,000 bales above a year's requirements.**
2. **The Egyptian Government estimated this year's crop acreage at 1,873,000 acres, a 65% increase over last year.**
3. **Cotton in cultivation on July 1 was 40,798,000 acres, against 36,452,000 a year ago and 35,939,000, 2 years ago. This figure does not include the cut of 10,000,000 acres agreed to by growers.**
4. **The processing tax of 4.2%, effective August 1, has induced manufacturers to build up large inventories.**

WEEKLY AVERAGE PRICES OF MIDDLING COTTON

Week Ended	Cents per Pound
July 1	10.28
July 8	10.34
July 15	11.23
July 22	10.93

Reports conflict as to the possibility of effecting the 25% acreage cut this year. With prospects of 12¢ cotton and $1 wheat, farmers do not favor destroying 20 or 25% of their crop. A year ago cotton was selling under 6¢.

Cotton textile operators meeting in Washington this week to form an industrial control plan promulgated rather revolutionary measures. Their 40-hour week was opposed by organized labor which wanted a 30-hour week, but by raising the minimum wage $2 to $12 in the South and $13 in the North, and by a proposal to banish child labor, the code went through. It was estimated that the plan would add 100,000 workers to payrolls that did not appear in 1929. The code will become operative in 2 weeks if President Roosevelt signs it promptly. General Hugh S. Johnson, Industrial Administrator, presided and worked with the manufacturers, commending them upon the spirit of cooperation they displayed.

Cotton forwardings continued to advance to new high levels, but at a slower rate. Last week spinners took 344,000 bales, against world takings of 194,000 in the same week last year, bringing the total to 13,094,000 bales for the year, which is ahead of 1932.

Week ended July 8. Numerous factors influenced the cotton market in the past week: acreage reduction; the World Economic Conference; action of the dollar in foreign markets; and the government's first acreage report. Prices, losing and gaining about ¼¢ twice in the week under these various items, closed the week 4 points up to 4 points down.

July closed at 10.10¢, compared with 10.14¢ a week ago; October 10.40 unchanged; December 10.56 against 10.55; January 10.62 unchanged; March 10.79 against 10.75; and May 10.92 unchanged.

The Department of Agriculture estimated that the area of cotton in cultivation on July 1 was 40,798,000 acres, against 36,452,000 a year ago. The maximum private estimate was 40,000,000 bales. Since the report was received after the close of Saturday's market, its reaction is still forthcoming. If the figures can be reduced 25% by the plan for plowing under that much cotton, the report would look altogether different.

The domestic stock on cotton June 1, according to the Department of Agriculture, was 10,739,000 bales, against 11,296,000 last year, and 7,800,000 in 1931. World consumption for the first 10 months of 1933 was estimated by the Exchange Service at 1,000,000 bales higher than that of 1932.

The decline of the dollar in foreign markets raised prices sharply, as did the President's positive refusal to join any scheme for stabilizing the dollar at present and until our domestic program had been given a fair trial.

Week ended July 15. Success of the government's acreage reduction plan, an all-time record for June output of cotton mills, and a reported drought in the South effected a rise of from 1.15 to 1.22¢ in cotton prices. A fear that the processing tax might retard output and light rains at the week-end prompted some profit taking.

July cotton closed the week at 11.25¢, compared with 10.10¢ the week before; October 11.55 against 10.40; December 11.76 against 10.56; January 11.85 against 10.62; March 11.93 against 10.79; and May 12.13 against 10.92.

Secretary Wallace received pledges from growers to destroy 3,500,000 bales of cotton growing on about 9,000,000 acres in return for rents and other benefits to be financed through a processing tax of 4.2¢ a pound, effective August 1. Signing of the plan by the President was the signal for a sharp increase in prices.

The June consumption report showed the largest takings since the Census Bureau started records in September, 1912. Consumption was 696,472 bales,

compared with the next largest on record of 693,081 bales in March, 1927. In May, 1933, 621,000 bales were consumed, and in June, 1932, 323,000.

American stocks of cotton in manufacturing establishments and public storages totaled 7,719,748 bales on June 30, compared with 8,715,584 on May 31, 1933, and 8,471,640 on June 30, 1932. Exports in June were 614,561 bales of lint, compared with 591,647 in May this year and 360,205 in June last year.

The lack of moisture in the South was relieved by light showers, but the greatest danger is in Texas and Oklahoma, where the rainfall in June has been the lightest in several years. Under high temperatures crop deterioration has been reported. Private reports state that over 5,000,000 acres were offered by Texas growers alone toward the acreage reduction plan. Perhaps the threat of drought had something to do with the offers.

Week ended July 22. Violent price changes and tremendous volume featured the cotton market last week. Before a heavy wave of liquidation hit prices, they had reached new high records for the year with October at 12¢. But when the stock and wheat markets suffered a corrective relapse, cotton followed suit. The beginning of the break, compared with 1929 conditions by some, resulted from an over-buying of alcohol stocks on the Stock Exchange as a result of growing sentiment for repeal of the Eighteenth Amendment. Losses as high as $20 a share were registered before the market steadied. Wheat also broke sharply. Cotton prices on Friday broke $6.75 a bale in sympathy with these markets before a rally erased part of the loss. Net losses on Thursday were $3.60 to $4 a bale.

For the week cotton prices were down from 113 to 126 points. July closed at 10.03¢, compared with 11.25¢ the week before; October 10.29 against 11.55; December 10.50 against 11.76; January 10.64 against 11.85; March 10.80 against 11.93, and May 10.90 against 12.13.

Clerks in Wall Street were nearly frantic under the top-heavy load of work that descended on them like an avalanche. Threats of strikes were heard, and in order to give the overworked staffs a breathing space the Board of Governors ruled that the Stock Exchange would open at noon next week and close on Saturdays. The Commodity Exchange will remain open as usual.

The drought that was affecting the crop adversely in Texas and Oklahoma was only partially relieved during the week, with only 4 out of 30 stations in Texas reporting more than an inch of moisture. In the East the crop is about normal, with little weevil activity.

The Census Bureau reported that cotton spinning reached a new high record in June, operating at 129.1% of capacity on a single-shift basis, against 112.3% in May and 57.6% in June, 1932. In the first half of July the New York Cotton Exchange Service reported that even this record was surpassed, with activity at 128% of the average 1922-27 rate.

The reaction expected occurred in cotton forwardings for the week ended July 15. The index of *The New York Times* dropped to 272.1 from 277.2 in the previous week. For the same week a year ago the index was 67.0. Actual forwardings were 150,000 bales, compared with 182,000 in the previous week and 42,000 last year.

It was also disclosed during the week that pledges for destruction of 10,000,000 acres of cotton had been received instead of the 9,000,000 first announced. Counting a third of a bale to an acre, this move will mean a cut of over 3,000,000 bales in the present crop.

Cotton futures continued to improve on July 25, and slight gains were made in comparison with Saturday's figures. Monday's closing prices were up 36 to 42 points, representing an advance of $5.75 a bale, or 115 points from last week's lows.

Spot middlings advanced 35 points to 10.55¢ on Monday.

In the New England staple market only moderate trading was reported on July 25 as the mills continued to buy only for immediate needs. Inch cotton was the most active, with medium and long staple inactive. Egyptians were also inactive, with prices nominally unchanged.

New York Quotations

July 25, 1933

	Cents
Drills	
38-inch 2.00-yard ...yd.	$0.15
40-inch 3.47-yard	.09¼
50-inch 1.52-yard	.21⅜
52-inch 1.90-yard	.17⅜
52-inch 2.20-yard	.15½
52-inch 1.85-yard	.17⅞
Ducks	
38-inch 2.00-yard D. F. ...yd.	.14½
40-inch 1.45-yard S. F.	.22
72-inch 1.05-yard D. F.	.30½
72-inch 16.66-ounce	.33⅓
72-inch 17.21-ounce	.34½
MECHANICAL	
Hose and belting ...lb.	.32
TENNIS	
52-inch 1.35-yard ...yd.	.24
***Hollands**	
GOLD SEAL	
30-inch No. 72 ...yd.	.18
40-inch No. 72	.19½
RED SEAL	
30-inch ...yd.	.15½
40-inch	.16½
50-inch	.22½
Osnaburgs	
40-inch 2.34-yard ...yd.	.13¾
40-inch 2.48-yard	.12⅞
40-inch 3.00-yard	.10⅝
40-inch 10-ounce part waste	.16¾
40-inch 7-ounce part waste	.11¾
37-inch 2.42-yard	.13¼
Raincoat Fabrics	
COTTON	
Bombazine 60 x 64 ...yd.	.10¼
Bombazine 60 x 48	.09¾
Plaids 60 x 48	.11
Plaids 48 x 48	.10½
Surface prints 60 x 64	.12½
Surface prints 60 x 48	.11¾
Print cloth, 38½-inch, 64 x 60	.07
Print cloth, 38½-inch, 60 x 48	.06
SHEETINGS, 40-INCH	
48 x 48, 2.50-yard ...yd.	.11
48 x 48, 2.85-yard	.10
64 x 68, 3.15-yard	.10½
56 x 60, 3.60-yard	.09½
44 x 48, 3.75-yard	.08¼
44 x 40, 4.25-yard	.07⅝
SHEETINGS, 36-INCH	
48 x 44, 5.00-yard ...yd.	.06½
44 x 40, 6.15-yard	.05½
Tire Fabrics	
BUILDER	
17¼ ounce 60" 23/11 ply Karded peeler ...lb.	.39
17¼ ounce 60" 10/5 ply Karded peeler ...lb.	.34
CHAFER	
14 ounce 60" 20/8 ply Karded peeler ...lb.	.39
12 ounce 60" 10/4 ply Karded peeler ...lb.	.34
9¼ ounce 60" 20/4 ply Karded peeler ...lb.	.40
9¼ ounce 60" 10/2 ply Karded peeler ...lb.	.35
CORD FABRICS	
23/5/3 Karded peeler, 1 1/16" cotton ...lb.	.39
23/4/3 Karded peeler, 1 1/16" cotton ...lb.	.40
15/3/3 Karded peeler, 1 1/16" cotton ...lb.	.37
13/3/3 Karded peeler, 1 1/16" cotton ...lb.	.36
7/2/2 Karded peeler, 1 1/16" cotton ...lb.	.34
23/5/3 Karded peeler, 1¼" cotton lb.	.46
23/5/3 Karded Egyptian, Egyptian upper cotton ...lb.	.48
23/5/3 Combed Egyptian ...lb.	.51
LENO BREAKER	
8¼ ounce and 10¼ ounce 60" Karded peeler ...lb.	.39

*Prices for 1,200 yards of a width or over.

Cotton Fabrics

DUCKS, DRILLS, AND OSNABURGS. The market experienced a continued rise in price with the aggressive buying demand. Mill stocks have been quite generally cleared, and with the shortening of the work week it is unlikely that inventory accumulations will be a factor for many months to come. Machinery is under engagement for an average of 60 days or more.

It remains to be seen what effect the added cost of cotton textiles by application of the processing tax will have on demand. For the present the necessity of the cloth consumer governs the situation; and until his requirements have been fully met, the market will not be put to a serious test as to price factor.

RAINCOAT FABRICS. The fall business for raincoats is just about getting started, and the present outlook is that the trade will be active this fall. Very attractive lines have been made up by all the manufacturers.

SHEETINGS. A steady improvement in demand for grey goods accompanied the rise in commodity prices. This demand slackened in the past few days. Before its renewal a period of consumption of goods will doubtless ensue.

TIRE FABRICS. Changes in price quotations advanced 1¢ a pound on all grades of tire cords on July 8, except on 15s 3-3 ply, which remained unchanged. The understanding in the market was that the presidential order exempting tire fabric manufacturers from the machine operation limit in the code was effective only for 3 weeks from July 17; and it applied to the independent manufacturers as well as to the tire companies making their own fabrics. The exemption applied only on machine hours and not on other provisions of the code.

CRUDE RUBBER

(*Continued from page 54*)

scored in the last few weeks. Commission and Wall Street houses were the prime factors; and once the decline started, stop-loss orders were uncovered, and those who had bought rubber for speculative account dumped their contracts on the market, depressing prices for about 1¢ a pound on 2 occasions.

At the beginning of the week, in a record day's trading of 22,110 long tons, prices continued the previous week's advance. Profit taking started the ball rolling, and in a session in which 15,000 and 16,000 tons were traded, prices declined. On Thursday the record again was broken with trades of 22,830 long tons, followed by 20,240 tons on Friday. Net losses for the week aggregated from 2.65¢ to 3.20¢.

September contracts closed at 7.10¢, compared with 10.30¢ the week before; October 7.50 against 10.50; December 7.82 against 10.58; January 7.95 against 10.80; March 8.15 against 10.80; and May 8.20 against 10.90.

Market news was scarce during the week, the drop in prices resulting from the break in stock and grain prices. Speculative activity had resulted in over-bought conditions, with prices on the exchanges higher than warranted by the increase in business stability. It was a violent corrective measure with many accounts wiped out, but it was expected and welcomed. The Stock Exchange was forced to rule that trading would start at noon next week to allow houses to catch up with their work, but the commodity exchanges made no change.

While it would have taken an extremely favorable report to stop the decline last week, it was softened somewhat by restriction news. The London market was quite strong on news that the Dutch Colonial Minister, Dr. Colijn, and Dr. Woles, of the Colonial office, were headed for London to discuss restriction with the experts of the British Government.

A minority of traders thought that the rise in prices did not make restriction so urgent as it was, but with the fall in quotations the majority thought an announcement imminent.

The May tire figures were about as expected, with shipments increasing 41.8% over April, 1933, and 21.7% above May, 1932. Production was 66.1% higher than April and 35.8% higher than May, 1932. Casings on hand were about the same as those on April 30, but 27.9% below those on May 31, 1932. The June figures, when consumption was at a record high, are expected to be more favorable.

Automobile production advanced for the July 15 week, with production for the month now expected to reach 230,000 units. This would be 97% above July, 1932, production, and within 8% of last month's figures. Sales are still good, with no decided change reported. The index of production of *The New York Times*, adjusted for seasonal fluctuations, stood at 63.4 for the July 15 week, against 53.8 the week before and 32.4 in the same 1932 week.

In the Outside Market prices lost the gains made last week and were back at about the level prevailing on July 8. Medium-sized Akron factories were buyers on the decline, but only one or 2 traders reported any large amount of sales.

July ribbed smoked sheets sold at 7⅝¢, compared with 9¢ the week before; August-September 7⅝ against 9¼; October-December 7⅞ against 9½; January-March 8⅛ against 9¾; and April-June 8⅜ against 10¢.

Advice from Amsterdam, reporting that an important announcement relating to restriction would be made in the near future, created on July 25 great activity on the Exchange. The market continued strong during the day, closing with 90 to 100 points higher than Saturday's close. Local sales were 10,470 tons. While speculative interest predominated, dealer and factory buying was in evidence. Spot ribbed smoked sheets were sold at 8 7/16¢.

EDITOR'S BOOK TABLE

Book Reviews

"Rubber and Automobiles." By Colin Macbeth. With foreword by F. W. Lanchester. Issued by The Rubber Growers' Association, Inc., 2, 3, and 4 Idol Lane, Eastcheap, London, E.C.3, England. May, 1933. Paper, 109 pages, 5½ by 8⅝ inches. Charts, Index.

This book is intended primarily for all those interested in the manufacture, supply, and use of rubber for automobiles. It contains the following separate sections bound together in a loose-leaf cover to facilitate the inclusion of additional matter: tire development, rubber in suspension systems, rubber chassis parts attached to frame, rubber in power plant, rubber in transmission systems, rubber in braking systems, rubber in steering systems, rubber in coachwork, body constructions and seatings, rubber in electrical systems, rubber latex, rubber specifications and standards.

Rubber as a major item in the suspension system is a novelty to the average motorist. The book, however, shows a number of directions in which this use of rubber is being developed. It is only necessary to consider rubber usage in tires and their vastly increased efficiency to realize the benefits likely to accrue to the motorist when satisfactory ways of using rubber on the suspension systems have been proved and adopted.

New Publications

"The Morris Improved Trimming Machine for Mechanical Rubber Goods." T. W. Morris, 6312 Winthrop Ave., Chicago, Ill. This booklet will acquaint those interested with the latest improvements made in this well-known trimmer for all sizes and styles of molded rubber goods in round or circular form. The machine will trim the smallest sizes 5 inches inside diameter, and also on the outside position, up to 6 inches outside diameter, trimming inside and outside in one operation.

"Something about Spheron." Godfrey L. Cabot, Inc., 940 Old South Building, Boston, Mass. This well-printed and illustrated brochure describes in detail the superior qualities of Spheron dense, dustless black.

"Robertson Reminders." John Robertson Co., Inc., 121-35 Water St., Brooklyn, N. Y. No. 2 of this series of booklets features the laboratories of the company and its lead cable encasing machinery, lead trap and bend extrusion press, 100-ton hydraulic bonding or splicing press, and high pressure hydraulic pumps.

"Schrader Tire Valves, Tire Gages." Vol. 6. A. Schrader's Son, Inc., Brooklyn, N. Y. This catalog issue covers the complete line of Schrader tire valve and gage products, with parts numbered, illustrated, and dimensioned. Also included are valve applying machines, service tools, heater equipment, water bottle fittings, ferrule contracting machines for valves and hose couplings. Supplemental to this catalog are 2 charts: for Schrader Valve Practice and for Schrader Convertible Valve Practice.

Injuries Fatal to Mill Man

An employe working on a mill had both arms crushed when they were caught in the rolls, and, as a result, he died several hours later. There is perhaps nothing more gruesome than such an accident. Those of us that are interested in the prevention of accidents are probably familiar with the poem which tells of a community that, instead of installing a guard-rail to prevent persons from falling from the top of a cliff, kept an ambulance in the valley below to carry away the dead and injured. Why not check up today on the following questions:

Are your mill line safeties tested daily? Are your men instructed never to reach into the mill to recover their knife or shove down a piece of stock? Are your men drilled on proper use of emergency tools? Are you allowing only one operator to work on a mill line? Are your men allowed to cut off stock with one arm crossed over the other?—*Rubber Section, National Safety Council.*

CLASSIFIED ADVERTISEMENTS

SITUATIONS WANTED

CHEMIST, B.SC., AGE 37, MARRIED, 12 YEARS' EXPERIENCE in alkalis, heavy chemicals, organic accelerators and analyses, rubber and rubber reclaiming, etc. Desires permanent position in rubber or allied industry. Address Box No. 243, care of INDIA RUBBER WORLD.

SUPERINTENDENT: WITH 27 YEARS' EXPERIENCE IN ALL mechanical lines, auto accessories, tapes, etc. Excellent record and references. Address Box No. 252, care of INDIA RUBBER WORLD.

MAN WITH 20 YEARS' EXPERIENCE IN CALENDER AND MILL room, also compounding. Capable of taking charge of calender room and mills. Can give excellent reference. Address Box No. 253, care of INDIA RUBBER WORLD.

CHEMIST, B.SC., LABORATORY AND PLANT EXPERIENCE IN compounding, processing, and process control. Wide experience in industrial and analytical chemistry. Address Box No. 248, care of INDIA RUBBER WORLD.

FACTORY MANAGER DESIRES NEW CONNECTION. 30 years' practical experience in the manufacture of tires and tubes, conveyer and transmission belting, air, steam, water and suction hose, braided hose and fire hose, valves and packing, rubber covered rolls, molded and general mechanical rubber goods. Well versed in mills, calenders, and tubing machines. Expert compounder and can handle men. Can control costs and control uniformity of product at all times. Address Box No. 250, care of INDIA RUBBER WORLD.

SITUATIONS WANTED—Continued

ASSISTANT SUPERINTENDENT OR GENERAL FOREMAN: EXperienced in both soft and hard rubber mechanicals, calenders, mills, and presses. Knowledge of compounding. Reputed excellent handler of men. Address Box No. 247, care of INDIA RUBBER WORLD.

FACTORY MANAGER OR GENERAL SUPERINTENDENT: AT present employed with one of the major companies, desires to connect with small progressive company. Complete knowledge of entire mechanical line, also flooring, soles and heels, paper mill press rolls, hard rubber, and sundries. Excellent trainer of men. Willing to go abroad. Address Box No. 244, care of INDIA RUBBER WORLD.

SITUATIONS OPEN

TECHNICAL GRADUATE, EXPERIENCED IN INdustrial and garden hose, wrapped and lead press or molded process. Give age, education, experience, dates, and salaries. Address Box No. 245, care of INDIA RUBBER WORLD.

WANTED: EXPERIENCED SALESMEN WITH GOOD CONNECtions on rubber surface clothing for Chicago and other territories. The Fine Rubber Co., Malden, Mass.

LATEX SALESMAN: WELL FINANCED COMPANY NOW BEING formed requires services of young man to sell compounded latex solutions. Preference given to man who has had previous experience in this line. A man with a following which will produce immediate results is essential to qualify. No patent situation is involved in the sale of these solutions. Address Box No. 249, care of INDIA RUBBER WORLD.

BUREAU OF STANDARDS SCIENTISTS AVAILABLE

Fifteen men experienced in research, testing, and other work on rubber have been separated from the staff of the Bureau of Standards on account of drastic curtailment of funds resulting from the Government's economy program, and are now seeking employment.

Each of these men has had experience in one or more of the following fields:

- Testing
- Microscopy
- Organic chemistry
- Mathematical physics
- Trade standards
- Specifications
- Safety engineering
- Compounding
- Photoelasticity
- X-ray
- Thermal conductivity
- Cable development

Inquiries will be referred to the men best qualified.

Address Box No. 242, care of
INDIA RUBBER WORLD

(Advertisements continued on page 67)

Tire Production Statistics

	Pneumatic Casings—All Types		
	In-ventory	Produc-tion	Total Shipments
1931	6,219,776	38,992,220	40,048,552
1932	6,115,487	32,067,732	32,200,820
1933			
Jan.	5,789,476	1,806,277	2,077,268
Feb.	5,901,557	1,871,498	1,833,970
Mar.	5,831,981	1,630,319	1,673,502
Apr.	5,418,979	2,498,795	2,923,154
May	5,408,132	4,151,433	4,144,138
	Inner Tubes—All Types		
1931	6,337,570	38,666,376	40,017,175
1932	5,399,551	29,513,246	30,328,536
1933			
Jan.	4,957,298	1,674,557	2,028,100
Feb.	5,085,321	1,778,818	1,681,853
Mar.	5,095,340	1,506,141	1,521,736
Apr.	4,951,399	2,282,298	2,440,555
May	5,105,389	3,760,121	3,570,700

	Solid and Cushion Tires		
1931	38,815	136,261	167,555
1932	23,830	97,089	108,581
1933			
Jan.	21,956	5,536	6,868
Feb.	......	6,829	7,920
Mar.	......	6,795	6,622
Apr.	......	7,149	7,766
May	......	9,229	9,256

	Cotton and Rubber Consumption Casings, Tubes, Solid and Cushion Tires		Consumption of Motor Gasoline (100%)
	Cotton Fabric Pounds	Crude Rubber Pounds	Gallons
1931	151,143,715	456,615,428	16,941,750,000
1932	128,981,222	416,577,533	15,698,340,000
1933			
Jan.	7,899,233	27,368,276	1,110,564,000
Feb.	7,263,337	25,123,700	979,608,000
Mar.	6,364,276	21,508,416	1,186,122,000
Apr.	10,460,327	35,169,724	1,267,392,000
May	16,778,354	58,202,264	1,427,958,000

Rubber Manufacturers Association, Inc., figures representing approximately 80% of the industry with the exception of gasoline consumption.

Rims Approved by The Tire & Rim Association, Inc.

Rim Size	6 Mos., 1933 No.	6 Mos., 1933 %	6 Mos., 1932 No.	6 Mos., 1932 %
Motorcycle				
24x3	475	0.0	649	0.0
Clinchers				
30x3½	2,157	0.0	4,678	0.1
Drop Centers				
16x3.62F	......	...	20	0.0
17x3.00	450,144	10.0	6,401	0.2
17x3.25E	787,330	17.0	127,100	3.2
17x3.62F	945,828	21.0	313,513	7.8
17x4.00F	172,339	3.8	8,945	0.2
17x4.19F	22,382	0.5	57,692	1.4
18x2.15B	20,395	0.5	8,956	0.2
18x3.00D	466,923	10.4	1,352,230	22.9
18x3.25E	97,842	2.2	991,188	24.8
18x3.62F	1,697	0.0	66,945	1.7
18x4.00F	2,445	0.1	65,517	1.7
18x4.19F	12,155	0.3	37,703	0.9
19x2.15B	2,959	0.1	5,416	0.1
19x3.00D	16,632	0.4	47,768	1.2
20x2.75D.	......	...	123	0.0
21x2.75D	484	0.0	......	...
21x3.25E	22	0.0	......	...
Semi Drop Base				
17x3.62F	......	...	9,981	0.2
19x3.00D	......	...	10,468	0.3
Flat Base				
17x4	659	0.0	8,246	0.2
17x4½	......	...	8,636	0.2
17x5	4,913	0.1	2,727	0.1
18x3.25	......	...	1,193	0.0
18x4	1,852	0.0	10,144	0.3
18x4½	409	0.0	91	0.0
18x5	5.474	0.1	3,474	0.1
19x2.75	3,363	0.1	6,150	0.2
19x3.00	504	0.0	345	0.0
19x4	5,268	0.1	10,064	0.3
19x4½	1,910	0.0	4,993	0.1
19x5	841	0.0	2,003	0.1
20x2.75	7,008	0.2	6,408	0.2
20x3½	677	0.0	11,593	0.3
20x4	1,114	0.0	4,372	0.1
20x4½	694	0.0	1,673	0.0
20x5	641	0.0	7,655	0.2
20x6	......	...	906	0.0
21x2.75	1,962	0.0	1,074	0.0
21x3½	1,566	0.0	7,950	0.2
21x4	611	0.0	4,096	0.1
21x4½	1,349	0.0	2,914	0.1
Flat Base (*Continued*)				
21x5	205	0.0	48	0.0
21x6	302	0.0	500	0.0
High Pressure				
30x3½	2,118	0.0	......	...
32x4	201	0.0	558	0.0
32x4½	312	0.0	......	...
34x4½	211	0.0	358	0.0
18" Truck				
18x5	284	0.0	3,015	0.1
18x7	3,268	0.1	2,704	0.1
18x8	147	0.0	248	0.0
20" Truck				
20x5	601,088	13.3	576,782	14.4
20x6	138,697	3.1	84,558	2.1
20x7	58,986	1.3	39,200	1.0
20x8	25,706	0.6	29,148	0.7
20x9/10	2,870	0.1	3,567	0.1
20x10.50	202	0.0	219	0.0
20x11	197	0.0	521	0.0
22" Truck				
22x7	601	0.0	349	0.0
22x8	4,331	0.1	3,087	0.1
22x9/10	1,051	0.0	3,705	0.1
24" Truck				
24x6	2,294	0.0	1,512	0.0
24x7	4,282	0.1	3,926	0.1
24x8	10,633	0.2	13,958	0.4
24x9/10	4,802	0.1	3,817	0.1
24x11	20	0.0	320	0.0
Low Pressure				
15x5.00E	35,499	0.8	12,714	...
15x5.50E	20,218	0.5	49,089	...
16x3.50D	150	0.0	......	...
16x4.00D	446,625	9.9	95	...
16x4.50D	62,989	1.4	28,874	...
16x5.00E	684	0.0	996	...
16x5.50E	187	0.0	2,177	...
16x6.00E	548	0.0	163	...
16x4.50E	27,210	0.6	......	...
D.C. Tractor				
24x8.00	3,469	0.1	......	...
28x8.00	1,265	0.0	......	...
36x6.00	740	0.0	......	...
Airplane				
44x10	9	0.0	......	...
Totals	4,505,425	...	4,088,208	...

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

No.	Inquiry
1594	Manufacturer of Emuwax.
1595	Manufacturer of Triethanolamine.
1596	Manufacturer of gutta percha tissue.
1597	Manufacturer of gas main bags.
1598	Manufacturer of Duralon.
1599	Manufacturer of wrapping bands.
1600	Manufacturer of latex household gloves.
1601	Manufacturer of oilproof tubing.

World Rubber Shipments—Net Exports

	Long Tons—1933 Mar.	Apr.	May
British Malaya			
Gross exports	42,059	36,752	42,902
Imports	7,964	7,758	13,664
Net	34,095	28,994	29,238
Ceylon	4,905	4,582	4,643
India and Burma	389	272	...
Sarawak	571	624	1,091
British N. Borneo	*400	*400	*400
Siam	304	235	359
Java and Madura	5,092	5,226	6,782
Sumatra E. Coast	6,466	5,969	7,298
Other N. E. Indies	6,900	7,934	5,728
French Indo-China	1,047	*1,053	*1,436
Amazon Valley	995	556	...
Other America	...	...	...
Africa	*100	*100	*100
Totals	61,264	55,945	...

*Estimate. *Compiled by Rubber Division.*

British Malaya

An official cable from Singapore to the Malayan Information Agency, Malaya House, 57 Charing Cross, London, S.W.1, England, gives the following figures for June, 1933:

Rubber Exports: Ocean shipments from Singapore, Penang, Malacca, and Port Swettenham

To	June, 1933 Sheet and Crepe Rubber Tons	Latex Concentrated Latex and Revertex Tons
United Kingdom	4,385	151
United States	24,682	161
Continent of Europe	7,989	256
British possessions	1,071	40
Japan	2,377	47
Other countries	251	1
Totals	40,755	656

Rubber Imports: Actual, by Land and Sea

From	Dry Rubber Tons	Wet Rubber Tons
Sumatra	544	5,536
Dutch Borneo	699	6,914
Java and other Dutch islands	176	32
Sarawak	1,103	46
British Borneo	200	38
Burma	243	25
Siam	249	383
French Indo-China	253	65
Other countries	27	5
Totals	3,494	13,044

Plantation Rubber Crop Returns by Months

1933	Borneo (26 Companies) Long Tons	Index	Ceylon (102 Companies) Long Tons	Index	India and Burma (21 Companies) Long Tons	Index	Malaya (338 Companies) Long Tons	Index	Netherlands East Indies: Java (60 Companies) Long Tons	Index	Netherlands East Indies: Sumatra (60 Companies) Long Tons	Index	Miscellaneous (8 Companies) Long Tons	Index	Total (615 Companies) Long Tons	Index
January	360	73.6	1,124	55.1	120	21.4	12,450	100.1	2,556	97.3	3,837	95.2	124	68.5	20,571	92.0
February	323	66.1	905	44.3	46	8.2	11,613	93.4	2,703	102.9	4,207	104.3	54	29.8	19,851	88.8
March	315	64.4	994	48.7	126	22.4	10,498	84.4	2,761	105.1	4,143	102.8	93	51.4	18,930	84.6
April	302	61.8	1,246	61.0	136	24.2	10,520	84.6	2,863	109.0	3,823	94.8	121	66.9	19,011	85.0
May	328	67.1	895	43.9	117	20.8	11,863	95.4	3,020	115.0	4,134	102.5	131	72.4	20,488	91.6
5 months ending May,																
1933	1,628	...	5,164	...	545	...	56,944	...	13,903	...	20,144	...	523	...	98,851	...
1932	1,648	...	5,409	...	690	...	62,320	...	13,480	...	21,224	...	809	...	105,580	...

NOTE: Index figures throughout are based on the monthly average for 1929=100. Issued June 27, 1933, by the Commercial Research Department, The Rubber Growers' Association, Inc., London, England.

Classified Advertisements

Continued

BUSINESS OPPORTUNITIES

FOR RENT REASONABLE: SMALL FACTORY IN THE SOUTH suitable for manufacturing rubber merchandise. Has mill, calender, and vulcanizer installed. Owner may be interested in helping finance a good live selling number. Address Box No. 246, care of INDIA RUBBER WORLD.

MANUFACTURER LOCATED NEAR NEW YORK WILL CONsider to purchase outright or will finance and join in manufacturing and selling rubber specialties. Only rubber articles that are novel and that may have a potential market will be considered. Address Box No. 254, care of INDIA RUBBER WORLD.

MACHINERY AND SUPPLIES FOR SALE

FOR SALE: ONE 18 BY 54" BIRMINGHAM 4-ROLL CALENDER; one unused 18 by 30" heavy duty FARREL MILL, chain drive; complete line of W. & P. Mixers, Vacuum Shelf Driers, Calenders, Mills, Colloid Mills, Pebble Mills, Dough Mixers, Hydraulic Presses, Pumps, etc. Rebuilt, guaranteed. What machinery have you for sale? CONSOLIDATED PRODUCTS CO., INC., 13-16 Park Row, New York, N. Y.

FOR SALE: ONE NO. 3 BANBURY MIXER. ADDRESS BOX No. 251, care of INDIA RUBBER WORLD.

United States Statistics

Imports of Crude and Manufactured Rubber

	April, 1933		Four Months Ended April, 1933	
UNMANUFACTURED—*Free*	Pounds	Value	Pounds	Value
Crude rubber	45,337,759	$1,291,136	225,344,820	$6,926,707
Liquid latex	1,778,323	80,749	5,689,894	283,417
Jelutong or pontianak	471,137	26,856	3,126,915	175,875
Balata	15,766	2,054	218,856	24,755
Gutta percha	122,194	6,174	290,556	19,278
Siak, scrap, and reclaimed	334,685	1,831	1,060,836	6.446
Totals	48,059,864	$1,408,800	235,731,877	$7,436,478
Chicle, crude ... *Free*	436,612	$91,861	1,680,461	$442,943
MANUFACTURED—*Dutiable*				
Rubber soled footwear with fabric uppers ... *pairs*	60,141	$14,106	3,422,613	$494,383
Rubber toys	......	48,606	......	133,692
Druggists' sundries, n. e. s.	......	2,364	......	20,730
Combs, hard rubber .. *number*	218,842	7,045	1,746,724	50,769
Golf balls ... *number*	186,464	37,116	368,924	74,787
Tennis and other rubber balls ... *number*	178,883	9,287	1,049,607	40,796
Tires ... *number*	522	3,233	16,983	79,202
Other rubber manufactures	......	33,967	......	130,191
Totals	......	$155,724	......	$1,024,550

Exports of Foreign Merchandise

RUBBER AND MANUFACTURES				
Crude rubber	1,788,425	$70,111	10,486,364	$373,370
Balata	19,600	3,060	73,405	12,133
Guayule	......	......	3,400	408
Gutta percha, rubber substitutes, and scrap	10	7	7,259	1,116
Rubber manufactures	......	423	......	3,119
Totals	......	$73,601	......	$390,146

Exports of Domestic Merchandise

RUBBER AND MANUFACTURES				
Reclaimed	370,190	$12,232	1,849,238	$65,671
Scrap	4,960,321	59,081	14,815,873	198,384
Rubberized automobile cloth, *sq. yd.*	46,638	20,088	179,712	76,201
Other rubberized piece goods and hospital sheeting .*sq. yd.*	63,858	20,968	183,026	63,075
Footwear				
Boots ... *pairs*	3,235	6,818	15,344	31,115
Shoes ... *pairs*	18,557	6,815	39,009	16,539
Canvas shoes with rubber soles ... *pairs*	24,079	14,416	92,326	54,705
Soles ... *doz. pairs*	1,121	2,457	3,671	8,125
Heels ... *doz. pairs*	35,231	17,804	102,863	55,420
Water bottles and fountain syringes ... *number*	9,273	3,232	55,411	19,153
Gloves ... *doz. pairs*	7,244	13,689	21,549	42,058
Other druggists' sundries	......	19,535	......	94,468
Balloons ... *gross*	7,781	7,114	58,944	52,970
Toys and balls	......	1,735	......	6,779
Bathing caps ... *doz.*	11,440	18,311	28,691	45,754
Bands	24,888	6,459	81,389	22,129
Erasers	22,727	12,803	82,589	45,676
Hard rubber goods				
Electrical goods	91,683	7,743	289,531	27,651
Other goods	......	24,356	......	45,001
Tires				
Truck and bus casings, *number*	12,504	190,490	40,804	631,998
Other automobile casings, *number*	56,271	378,766	241,982	1,633,275
Tubes, auto ... *number*	42,882	46,788	160,138	161,133
Other casings and tubes, *number*	3,248	5,207	7,484	15,295
Solid tires for automobiles and motor trucks. *number*	591	14,416	2,113	54,333
Other solid tires	98,004	10,478	325,121	35,377
Tire sundries and repair materials	......	26,320	......	108,015
Rubber and friction tape	37,582	7,425	166,975	35,007
Belting	121,682	53,323	527,574	229,515
Hose	221,048	56,595	809,930	201,325
Packing	77,279	28,344	314,259	116,133
Thread	67,290	39,199	469,658	247,401
Other rubber manufactures	......	56,056	......	252,351
Totals	......	$1,189,063	......	$4,692,032

Low and High New York Spot Prices

All Prices in Cents per Pound

	July		
PLANTATIONS	1933*	1932	1931
Thin latex crepe	7⅜/10½	3 9/16/4	6¼/7¼
Smoked sheet, ribbed	6½/ 9¾	2⅝/3 3/16	5¾/6¾
PARAS			
Upriver fine	8¼/10¼	5½/5¾	8¼/8¾

*Figured to July 25, 1933.

Rubber Goods Production Statistics

		1933	1932
TIRES AND TUBES		April	April
Pneumatic casings			
Production	*thousands*	2,499	2,813
Shipments, total	*thousands*	2,923	2,958
Domestic	*thousands*	2,874	2,886
Stocks, end of month	*thousands*	5,419	7,877
Solid and cushion tires			
Production	*thousands*	7	8
Shipments, total	*thousands*	8	8
Domestic	*thousands*	7	8
Stocks, end of month	*thousands*	20	36
Inner tubes			
Production	*thousands*	2,282	2,580
Shipments, total	*thousands*	2,441	2,708
Domestic	*thousands*	2,410	2,658
Stocks, end of month	*thousands*	4,951	7,553
Raw material consumed			
Fabrics	*thous. of lbs.*	10,460	11,084
MISCELLANEOUS PRODUCTS			
Rubber bands, shipments	*thous. of lbs.*	191	202
Rubber clothing, calendered			
Orders, net	*no. of coats and sundries*	8,037	7,303
Production	*no. of coats and sundries*	14,227	9,711
Rubber-proofed fabrics, production, total	*thous. of yds.*	2,988	2,092
Auto fabrics	*thous. of yds.*	241	202
Raincoat fabrics	*thous. of yds.*	1,275	701
Rubber flooring, shipments	*thous. of sq. ft.*	218	546
Rubber and canvas footwear			
Production, total	*thous. of pairs*	3,172	4,104
Tennis	*thous. of pairs*	2,636	3,446
Waterproof	*thous. of pairs*	536	657
Shipments, total	*thous. of pairs*	3,672	5,073
Tennis	*thous. of pairs*	3,230	4,374
Waterproof	*thous. of pairs*	442	698
Shipments, domestic, total	*thous. of pairs*	3,637	5,010
Tennis	*thous. of pairs*	3,202	4,333
Waterproof	*thous. of pairs*	435	677
Stocks, total, end of month	*thous. of pairs*	14,462	18,381
Tennis	*thous. of pairs*	6,135	7,267
Waterproof	*thous. of pairs*	8,326	11,115
Rubber heels			
Production	*thous. of pairs*	10,353	11,737
Shipments, total	*thous. of pairs*	12,383	9,874
Export	*thous. of pairs*	281	280
Repair trade	*thous. of pairs*	4,441	2,656
Shoe manufacturers	*thous. of pairs*	7,661	6,938
Stocks, end of month	*thous. of pairs*	23,740	28,340
Rubber soles			
Production	*thous. of pairs*	3,108	2,292
Shipments, total	*thous. of pairs*	3,256	2,340
Export	*thous. of pairs*	1	1
Repair trade	*thous. of pairs*	266	252
Shoe manufacturers	*thous. of pairs*	2,988	2,087
Stocks, end of month	*thous. of pairs*	3,215	2,759
Mechanical rubber goods, shipments			
Total	*thous. of dollars*	2,273	2,613
Belting	*thous. of dollars*	371	430
Hose	*thous. of dollars*	903	1,251
Other	*thous. of dollars*	999	932

Source: *Survey of Current Business*, Bureau of Foreign & Domestic Commerce, Washington, D. C.

London Stocks, May, 1933

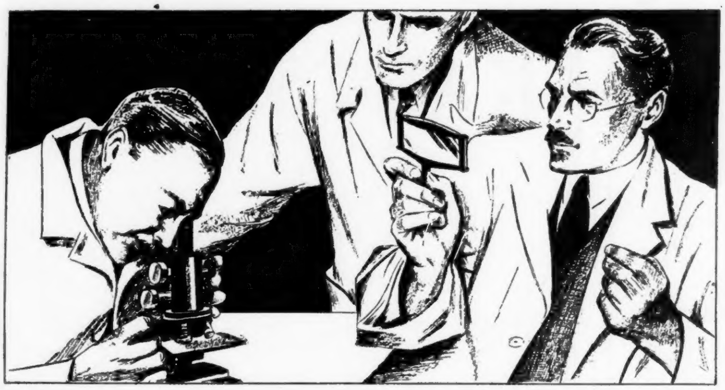
			Stocks, May 31		
LONDON	Landed Tons	Delivered Tons	1933 Tons	1932 Tons	1931 Tons
Plantation	3,992	2,909	41,944	56,040	86,608
Other grades	6	2	54	49	75
LIVERPOOL					
Plantation	*3,700	*1,315	*56,540	*59,926	*53,641
Total tons, London and Liverpool	7,698	4,226	98,538	116,015	140,324

*Official returns from the recognized public warehouses.

Imports by Customs Districts

	May, 1933 *Crude Rubber		May, 1932 *Crude Rubber	
	Pounds	Value	Pounds	Value
Massachusetts	6,951,675	$211,548	4,331,869	$180,069
Buffalo	......	......	2,128,051	115,406
New York	47,470,587	1,408,960	62,638,185	2,280,706
Philadelphia	1,030,127	28,650	489,558	17,463
Maryland	2,162,097	52,128	966,324	33,329
Mobile	......	......	1,702,088	43,237
Los Angeles	2,057,581	57,547	3,988,413	129,204
San Francisco	112,000	2,550	423,447	17,539
Oregon	......	......	11,200	570
Ohio	103,697	4,588	24,484	1,507
Colorado	......	......	180,004	7,333
Totals	59,887,764	$1,765,971	76,883,623	$2,826,363

*Crude rubber including latex dry rubber content.



The FUTURE *belongs to the* PROGRESSIVE...

To You . . .

who are not afraid of new ideas.

To You . . .

who can scan the horizon for new developments in service and research that will improve your product and set it into the tempo of the young progressive markets of today.

To You . . .

who are approaching the future in this spirit we have important news.

■ ■ ■ ■

Our chemists and research engineers are ready after long months of study and experiment to offer to the rubber and allied industries important new discoveries in the use of LATEX, LOTOL and DISPERSITE that will open up broad, new markets.

These new discoveries make possible new and profitable developments in impregnating, sizing, coating, cementing and "fixing" fibrous materials.

We have done the ground work. Now it is up to you to profit by it. At least, you should learn about these new developments for your own protection.

LATEX-DISPERSITE-LOTOL

The Naugatuck Chemical Company

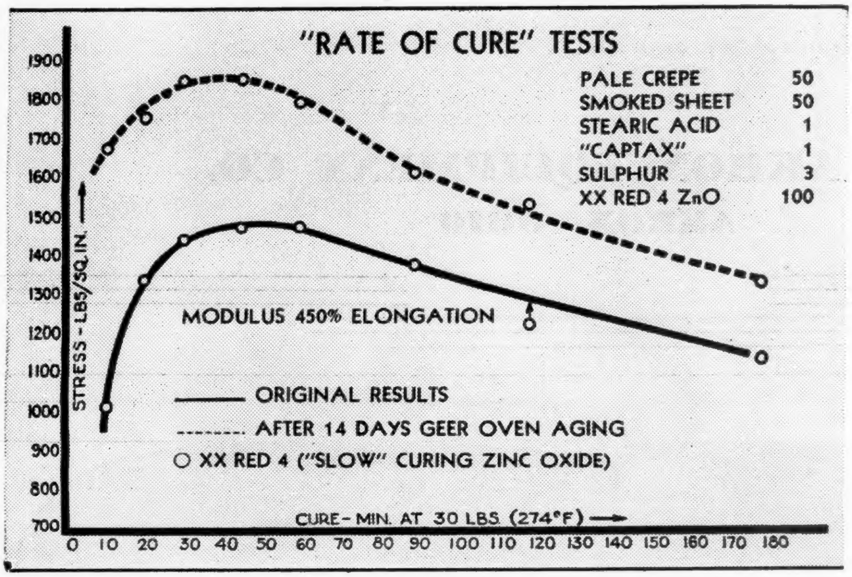
DISPERSIONS PROCESS, INC.

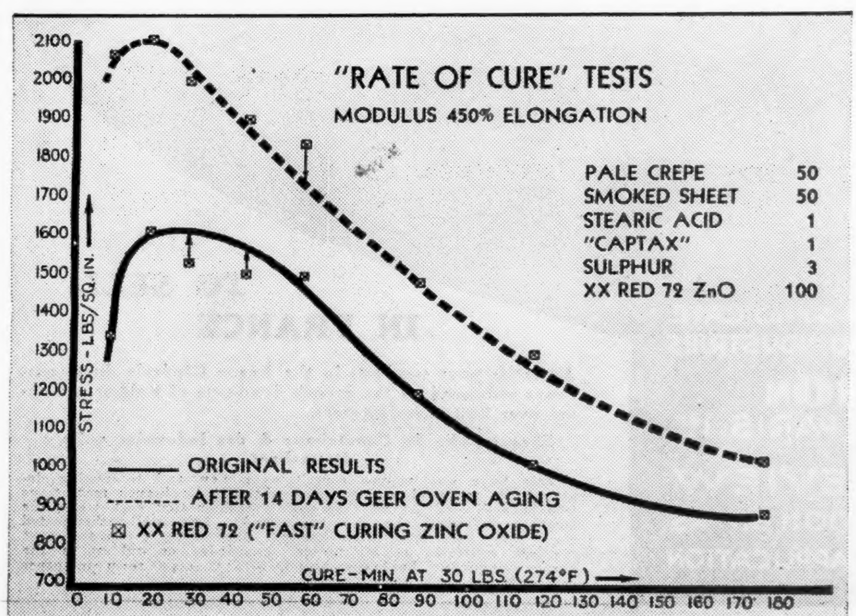
1790 BROADWAY . . . . NEW YORK, N. Y.

Note: Compared with XX Red 72, XX Red 4 gives a long range at which the modulus is at the optimum and shows less tendency to stiffen on aging. XX Red 72 shows a marked inclination to reversion. These data support the preference shown by many compounders for the "slow" curing type of oxide in high zinc stocks with Captax. An additional advantage of XX Red 4 is its "anti-scorch" properties.

The New Jersey Zinc Company 160 FRONT STREET NEW YORK

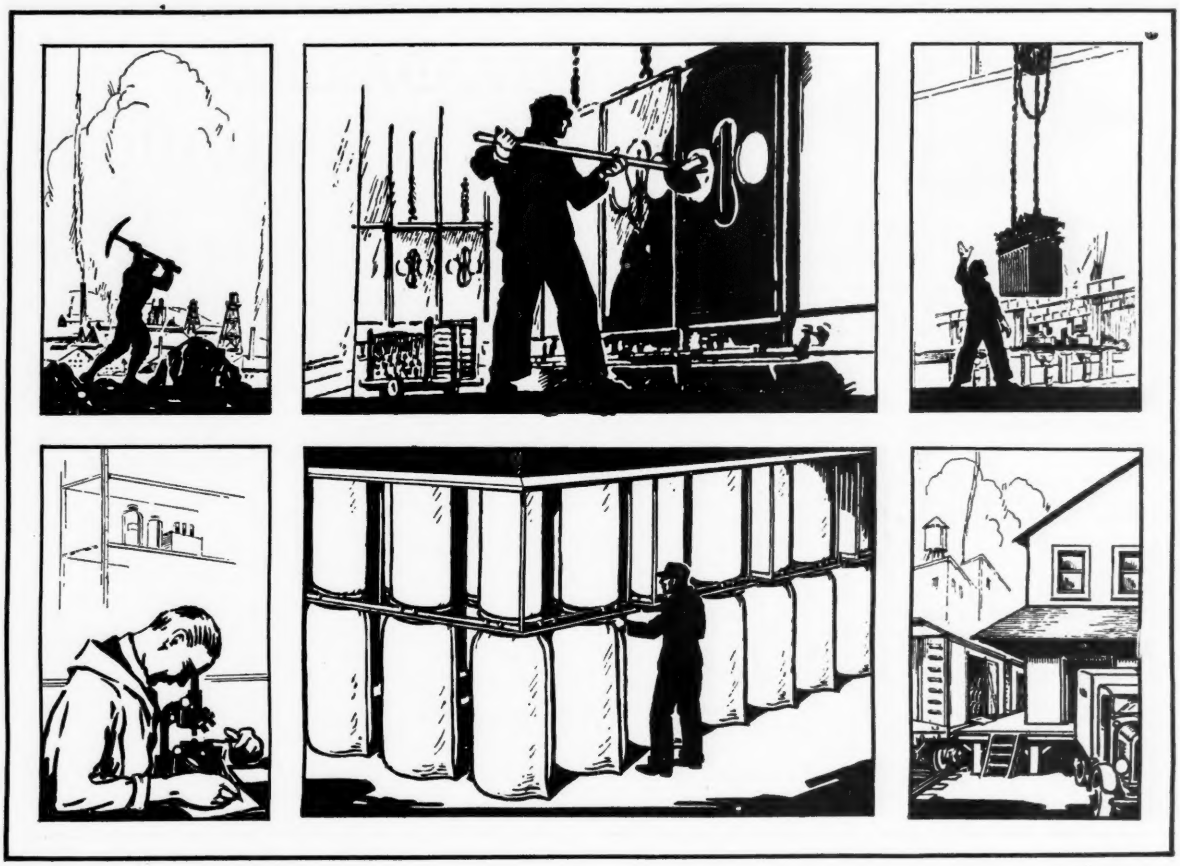
No. 19 of a series of charts showing a comparison of "fast" and "slow" curing zinc oxides with typical accelerators.

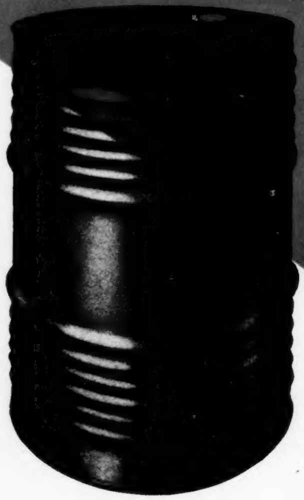


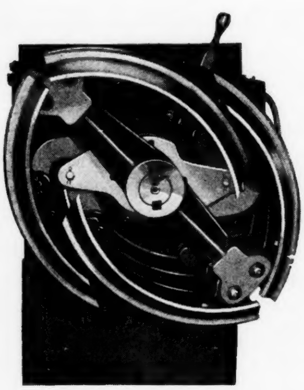


The effect on MODULUS of "SLOW" (XX Red 4) and "FAST" (XX Red 72) CURING Zinc Oxides in a CAPTAX Stock

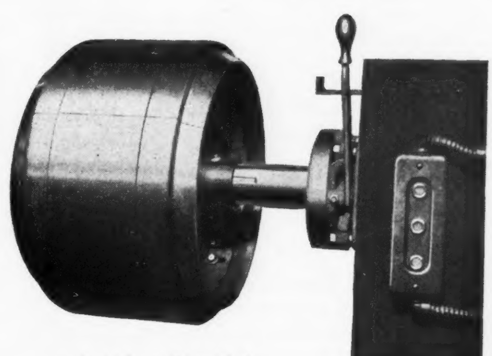
New Jersey Zinc







Autodrum Collapsed



Autodrum Expanded